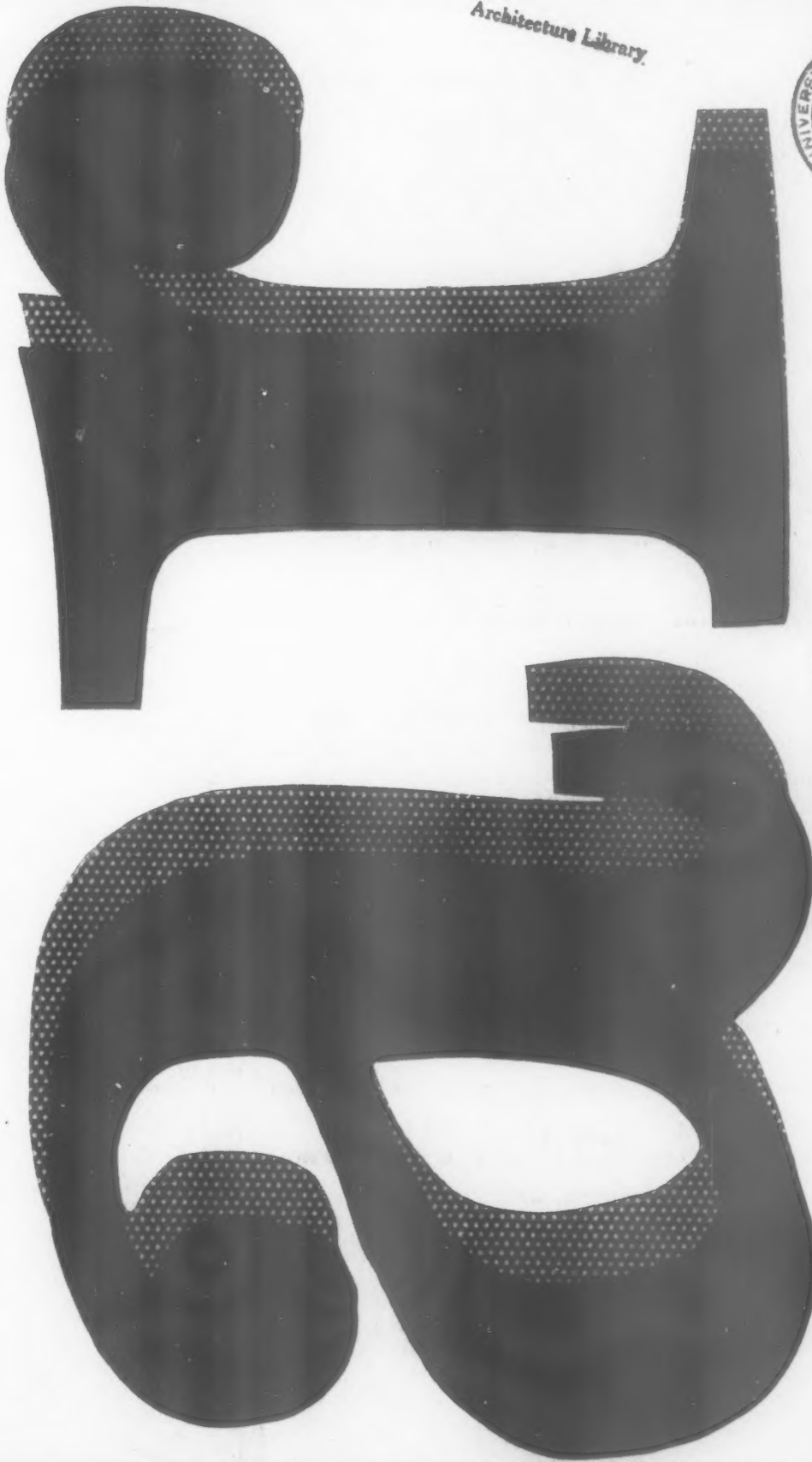


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THE ARCHITECTURAL REVIEW VOLUME OXXII NUMBER 729 SEPTEMBER 1957 FIVE SHILLINGS



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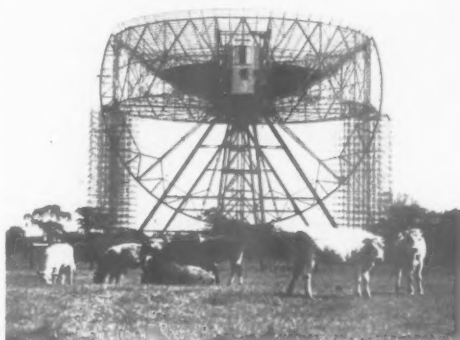
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## MARGINALIA

### New Shape in Cheshire

Manchester University's new giant radio-telescope at Jodrell Bank in Cheshire—a joint project with DISR and the Nuffield Foundation—is among the world's half-dozen largest pieces of research equipment, its reflector, seen partly clad in 1, weighing over 750 tons and exceeding 250 feet in diameter. This puts it in a class with the most powerful particle-accelerators for sheer mass, but unlike them it makes a better visual gesture on behalf of the extremities of scientific research. Although the structure is more complex than appeared from the earlier project-drawings, the final form—when the last scaffolding has been removed—is more dramatic than the ground-hugging buildings of the average cyclotron, more clear-cut than the aggregations of structures that house the average nuclear power-plant, with the added landscape advantage 1 over the latter that only one giant radio-telescope is ever likely to be needed, not one in every piece of unspoiled country (though the Cheshire landscape has special advantages, see p. 208).



mobiliare not only shows that the structure has been completed since February, 1956—a remarkable feat for a 26-storey building in Italy—but also gives a photograph of the model of the final version of the design, 2. What is most remarkable about the design, as seen here, is its strikingly Gothic aspect, not only in its rib and panel structure, which the Modern Movement inherited from nineteenth century Gothicists any-

how, but also in its silhouette, which seems to follow a tradition whose last notable representative was the tower of Big Ben.

### Hansa Quarter

The principal job of the Interbau, the International Building Exhibition in Berlin, is to demonstrate building by erecting a new quarter while the public watches. The Old Hansaviertel, 3, was bombed flat; it housed about 6,000, it will house now, 4, about 3,000 in over 1,200 dwellings distributed among 39 houses: 6 are point blocks of 16 storeys, 6 slabs of 8 to 10, 9 terraces of 3 to 4, 9 two-storey single family houses, and 9 single-storey villas or bungalows. In addition there are two churches, an underground station, a creche and a school.

The organizers, that is the Building Division of the City of Berlin, called in 53 architects, 19 from abroad, 16 from West Germany, 18 from Berlin. Among them are men of the stature of Gropius, Aalto, Le Corbusier and Niemeyer, and all the best Germans. The plan was to show one third complete, one third nearly complete, and one third under construction. As it is, three of the six point blocks are not started, and one of the six slabs, and hardly any of the single-storey and two-storey jobs exist as yet, not Arne Jacobsen's, not Kay Fisker's, nor incidentally F.R.S. Yorke's, the only English contribution.

Technically the big jobs are mostly box frame or other concrete slab constructions. Steel-skeleton is hardly used in Germany. The technically most interesting building is Hugh Stubbins' Congress Hall, a gift of the Americans. It is going up further East than the Hansa Quarter, not far from the former Reichstag. With its two huge concrete arches leaning widely forward in opposite directions from the same two points of support, with



### Hansa quarter

The Hansaviertel, built in the 1880's — 3, as it was before the war and 4, as it will be in 1958. For an explanation of the models, see AR December 1956, page 351.



its concrete ring in tension between their apexes and the roof suspended by steel wire it will be up to the most daring American structures of the same character, notably Nowicki's arena at Raleigh. But it is not ready yet. Architecturally it is curiously undecided or perhaps ruthless with the wide processional open staircase leading up to the principal auditorium, but not its main entrance for this lies at right angles to it under the shelter of the concrete arches. What faces the processional staircase instead is a tiny emergency staircase and an emergency exit. The concourse below the auditorium is divided by massive circular concrete supports which carry the auditorium floor and take part in carrying its walls. They also are obviously intended to be inelegant or perhaps one ought to say anti-Swedish. That the building will be extremely impressive there can be no doubt.

The design of the Hansa Quarter is excellent, free, bold and airy, and landscaping and floor-scaping are impeccably picturesque. It is true that for such a New Town look—in the best sense of the term—the quarter seems rather near the city centre, but it is bounded by the Tiergarten and no traces of a closer and denser urban past remain. Besides, as the quarter is also an exhibition, one could not have kept these slab- and point-builders together, unless one had given each a detached, fairly isolated job to do. Gropius's is a little disappointing, Aalto's surprisingly classical and beautifully planned inside, Vago's is interesting in plan, and somewhat chic outside with its arbitrary geometrical pattern of white, light-blue and yellow glass plates. Niemeyer's appears the most forceful, especially now that it is still unfinished, and Le Corbusier is working away miles from the Hansaviertel to be left alone with his Unité.

The others comply with the plan in positions, heights and bulk, and that makes for ideal exhibition conditions. Whether it will in the end be ideal for a permanent quarter of Berlin, remains to be seen. If you have five point blocks to mark the

north boundary of a quarter, surely from the point of view of permanency, they should be to the same design—as they are at Vällingby or Rotherhampton. The variety which delights in the exhibition may well prove to be carried too far for ultimate town-planning unity.

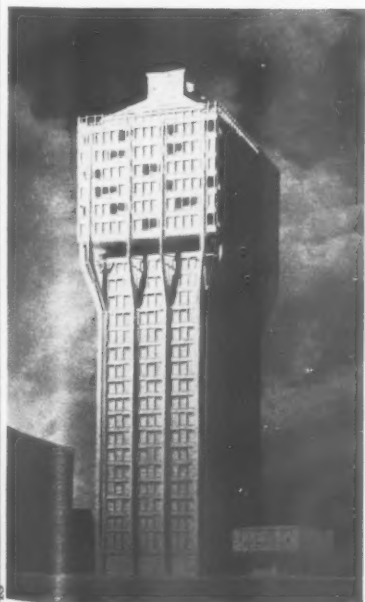
Still, the Hansaviertel remains an enterprise bolder than any that England could possibly have undertaken. One hates to be asked polite questions by German friends about the Barbican area. And at Berlin this boldness is not even an exception for an exceptional purpose. It is the very quality which pervades the whole of the reconstruction.

### Rotterdam Gabo Completed

The seventy-foot steel sculpture designed by Naum Gabo to stand by one end of the façade of the new *de Bijenkorf* (previously discussed in AR for March and May, 1956) is now



finished and installed, 5, the steelwork having been fabricated and erected by a Rotterdam shipyard. Certain aspects of the project that could not be appreciated from the model can now be more clearly assessed, notably the competition afforded visually by lamp-posts and other kerbside vertical features, on the debit side, and



Bilancio (1956)

the effects of shadows and reflections on the adjoining façade—transient benefits on the credit side that were not part of Gabo's original conception.

#### Shell at twenty-five

Shell advertising is part of the legend of the Thirties—one of the more durable parts, for it is still happily with us. To honour the silver jubilee of the merger that created the Shellmex-BP combine, the firm has issued (for internal circulation only) a survey of its advertising in the last quarter century. A study of it will reveal a number of points that have been forgotten in the myth-making process, and will go some way toward explaining why Shell advertising has survived when other well-meaning adventures of the period have not. For a start, the McKnight Kauffer posters, the Betje-man guides, the Bawden graphics were only a part of a total campaign that was far wider in scope, and leaned heavily on topical ephemera, gimmicks, awful puns, and even on self-mockery—Jack Beddington must have been the first publicity man to poke fun at his own advertising in his own advertisements. In other words, the book reveals that Shell not only contributed to the arts of the past twenty-five years, but—more important—participated in the life of the period as well.

#### Vista from Glasgow

Now in the third issue of its third incarnation, *Vista*, the journal of the Glasgow School of Architecture Club, can boast an unique history among student publications. It first appeared in the period 1908-15, when the Glasgow school (the academic institution) was very young but the other Glasgow School (the Art Nouveau of Mackintosh) was at the height of its fame. *Vista* remained dormant until 1931, when it was revived by Warnett Kennedy under the impact of the International Style, and after a further lapse has now been re-revived, primarily to celebrate the school's fiftieth anniversary in 1954, but with a determination to keep it running. The three issues of the new set are typographically and visually heterogeneous, not to say disappointing, but many of the contributions have been of the first quality in one way or another, notably Professor Smith's history of the school in *Vista* 1, articles by Maxwell Fry and Walter Gropius in *Vista* 2, and surveys of contemporary Swiss architecture and current student opinion in *Vista* 3.

#### Croft Castle

The owners of Croft Castle Herefordshire, want to give the house to the National Trust with an endowment; most of the money has been raised by members of the family but £5000 is still needed. This house, which will otherwise have to be demolished is medieval, but its unique feature is eighteenth century Gothick plasterwork in the same style as Shobdon Church, the only instance so far of any correspondence with that extraordinary building. It was owned and landscaped by the elder Thomas Johnes and may have been the prototype for both Hafoed and Payne Knight's Downton Castle. Donations should be sent to Croft Castle Endowment Fund, 47, Downshire Hill, London, N.W.3.

#### Moore Up-to-Date

The success of the Lund Humphries picture-books on Henry Moore's sculpture is a just reward for a brave publishing enterprise as

well as a tribute to the worldwide interest in Moore's work. An expensive book on a single modern artist is normally expected to sell in its hundreds rather than its thousands, yet since the Henry Moore book was first published in 1944 it has run through three editions, and the production of these, the new edition\* just out and the supplementary (1955) volume on Moore's work since 1948 has totalled no less than 13,000 copies.

The third edition (1949) was enlarged and revised and the fourth has been further revised by Mr. David Sylvester, only Sir Herbert Read's introduction remaining unchanged. Among 140 new blocks are illustrations of 30 sculptures and 39 drawings not included in the earlier editions, and a catalogue of all Henry Moore's works in sculpture from 1921 to 1948, whether illustrated or not.

### CORRESPONDENCE

#### Collins Almshouses, Nottingham

To the Editors,

Sirs,—My attention has been called to what is said on page 451 of the June, 1957, issue of your magazine about the Abel Collins Almshouses in Nottingham. This is a most undeserved attack on the Nottingham Corporation based on completely incorrect information.

The true facts are as follows.

The almshouses do not belong to the Corporation, have never belonged to the Corporation, are not the subject of any contract for purchase by the Corporation and are not the subject of any negotiations for purchase by the Corporation.

They are privately owned and the Corporation, as the Planning Authority, received an application for permission to develop the site which involved the demolition of the existing buildings.

The buildings are in the Ministry's list and the Corporation, as the Planning Authority, therefore had to notify the Ministry under the Town and Country Planning Act. The Ministry did not intervene.

As far as I am aware and as far as any responsible official of the Corporation is aware, the Ministry did not at any time send a telegram to halt the demolition as is alleged.

As far as I am aware, the Ministry, having failed to intervene when they received the notice, did not have any power to halt the demolition after the time expired.

The demolition was carried out by the owners and not by the Corporation, and as far as I am aware the demolition of the whole of the vacant part of the building was completed. The remaining part which has not as yet been demolished, still stands because it is occupied and I assume that the demolition will continue until it is completed when the present occupiers vacate.

No distinction was made by the Planning Committee of the Corporation between these owners of the property and any other owners.

Yours, etc.,

T. J. OWEN

Town Clerk, Nottingham.

[The Editors reply: We apologize for our incorrect information which was obtained, first, from an official source, second, from Nottingham Corporation's City Engineer's Department, and third, from press reports at the time of the demolition. As all three sources corroborated one another

\*HENRY MOORE: volume one, sculpture and drawings 1921-1948, London: Percy Lund, Humphries & Co.; A. Zwemmer, 1957. Price £4.4.0.

we did not make a quadruple check: evidently we should have done so.

We would, however, like to amplify this letter a little. The Corporation forwarded the Trustees' application to the Minister of Housing on March 5, 1956, saying that they were not satisfied that the almshouses merited preservation on architectural and historic grounds (Dr. Pevsner, 'Nottinghamshire': 'one of the best almshouses of its date in England'). The Ministry disagreed but neither made a preservation order nor told any of the interested societies; the statutory period of notice expired on May 5, 1956, a Saturday. Demolition started at 7 a.m. on the following Monday. The Georgian Group, S.P.A.B., and the Nottingham Society of Architects all wrote to the Ministry after it was too late protesting that they hadn't been told; if they had known they would obviously have opposed the demolition.

So the story is less sensational, and quite within the letter of the law, but just as deplorable. These almshouses were a national monument, Nottingham Corporation notwithstanding: to the shocking philistinism of the Corporation now must be added the shocking inertia of the Ministry.]

#### Counter-Attack

To the Editors,

Sirs,—I was delighted to receive a copy of *Town and Country Planning* this week.\* It is unmistakably evident that your campaign has succeeded in scaring many brooding hens off their nests. From all the cackling one gets the idea that the most effective means of awakening the barnyard was employed.

Again, my congratulations and admiration.

Yours, etc.,

RUSSEL BOURNE.

New York.

#### Modern Church Architecture

To the Editors,

Sirs,—If there is any contemporary architectural problem which calls for radical solutions it is certainly that of church design, as you remark in the caption to the frontpiece of the June number of THE ARCHITECTURAL REVIEW. Unfortunately, very few of the 'radical' solutions which we have been offered in recent years really go to the root of the problem, and in singling out the use in Carl Nyren's church at Vallingby of 'beton brut, naked and unadorned,' as symptomatic of a widespread feeling that radical solutions are necessary you would appear to confuse two widely divergent schools of thought.

There are those who, rejecting the assumption (which seems to be implicit in your caption) that church design is the one field in contemporary architecture where functional disciplines can be thrown to the winds, insist that good churches—no less than good schools or good hospitals—can only be designed through a radically functional approach. Those who take this view would add that the roots of the present problem are ultimately theological and liturgical in character: that one cannot hope to design a good church unless one is prepared to face, fairly and squarely, the question of what a church is for—and the answer to this question is by no means so simple, or so universally recognized, as is often supposed.

There are others—far more numerous—who are concerned rather to give to modern church architecture an emotional appeal which is assumed to be an indispensable property of cer-

\*The June issue, which contained several articles on Counter-Attack.

tain past styles but which is felt to be lacking in most contemporary buildings—"the glazed boxes of reason and maximum illumination." The premises of this school of thought are aesthetic and stylistic in character, and its 'solutions'—however beguiling on aesthetic grounds—are essentially superficial.

The use of *beton brut* may well be symptomatic of a desire to build a church which is honestly contemporary. The fact remains that some of the least satisfactory of recent churches are those which are most frankly 'modern.' The really radical problems of church design are of a different order.

Yours, etc.,

PETER HAMMOND.

Bagendon, Glos.

#### Intelligence

The R.I.B.A. Vice-Presidents for 1957-58 are: Harold Conolly, Essex County Architect; J. H. Forshaw, Chief Architect, Ministry of Housing and Local Government; Leonard C. Howitt, Manchester City Architect; and Thomas E. Scott. The honorary secretary is Basil Spence and the honorary treasurer is E. D. Jefferis Mathews. The R.I.B.A. have also appointed a Secretary for Professional Relations, Miss J. M. N. Milne, to conduct research into matters affecting the future of the profession.

Sir Alfred Bosson has been elected Chairman of the Council of the Royal Society of Arts for the next twelve months.

The Civic Trust has been founded under the presidency of Mr. Duncan Sandys. The Trust will raise funds from industry and use them to stimulate keener interest in the appearance of towns, villages and countryside, by means of conferences, films, television programmes, exhibitions and research. The other trustees are the Archbishop of Canterbury, Sir Herbert Manzoni, Mr. Herbert Morrison, Sir George Nelson, Lord Justice Pearce, Sir Howard Robertson, Sir Edward Spears and Mr. C. M. Vignoles.

### ACKNOWLEDGMENTS

The colour block on page 201 appears by courtesy of Mr. John R. Harris, A.R.I.B.A.

MARGINALIA, pages 153-4: 3, Luftbildtechnik; 4, Kessler; 5, Associated Press. FRONTPIECE: B. Holtman. THE WALDEGRAVE, STRAWBERRY HILL, pages 157-161: Dell and Wainwright. SCHOOL AT SYDENHAM, pages 162-5: Galwey, Arphot. WALLS OFF THE PEG, pages 166-187: 2, 5, 9, 12, 18, 20, Toomey, Arphot; 6, 10, 13, Peter Pitt; 3, Geo. Wragge; 4, Colin Westwood; 8, Hylton Warner; 11, G. L. Blake; 15, John G. Wilson; 16, Pictorial Press; 17, Cecil H. Greville. SHEPTON MALLEY, pages 188-193: 1, 2, 3, 14, 18, 19, Cullen, Arphot; remainder Nairn, Arphot. HOUSE AT WATFORD, pages 194-7: Toomey, Arphot. ROMAN CHURCH IN YORKSHIRE, pages 198-200: Galwey, Arphot. MISCELLANY, pages 203-8: Functional Tradition, Eric de Maré. Exhibitions: 4, Sidney Nolan; 6, S. Lambert. Counter Attack, Gomme and Nairn, Arphot. SKILL, pages 209-end: Interiors, 1, Zim Navig. Co.; 2, I. Kalter; 4, 5, 6: SS 'Sylvania', Elsam, Mann and Cooper. SS 'Gripsholm', Gösta Liden.

# THE ARCHITECTURAL REVIEW



**This Month's Cover**, a photograph of the Review's initials, emphasizes the revolution in graphic design and lettering that is taking place at present. Produced photographically from standard mechanical tints, the forms of these letters lie beyond the purview of any of the traditional creators of letter-form—penman, stone-cutter, engraver or architect. They could be reproduced photographically on new plastic-faced materials, thus by-passing another set of traditional formal determinants, the sign-writer's tools. They belong to a new world of lettering, one of whose provinces was explored by Kenneth Browne in August A.R., a world where success will depend, not on the ability to reproduce one or two fashionable prototypes, but on a knowledge of lettering as encyclopaedic as that provided by Nicolette Gray's articles, of which another will appear next month.

## 153 Marginalia

## 154 Correspondence

## 156 Frontispiece

**157 The Waldegrave Strawberry Hill** by *Osbert Wyndham Hewett* Though Strawberry Hill is chiefly a monument to the Gothick fantasy of Horace Walpole, much of what the visitor sees there today, and might take to be Walpole's responsibility, should be credited to Lady Frances Waldegrave, who took the place in hand in 1856, when it was in a semi-derelict condition. Her needs, as a political hostess of international influence, shaped her attitude to the house and the extensions to be made; her resources, and those of two successive husbands, governed the speed and manner in which the work was done—but only just, and Mr. Wyndham Hewett, who has recently completed a standard biography of Frances Waldegrave, gives a picture of a patroness of building whose determination and energy put her almost in the class of Bess of Hardwick.

**162 School at Sydenham: Architects,** *Basil Spence and Partners*

**166 Walls off the Peg** by *Michael Brawne and Alan Craig* Though it is almost fifty years since the pioneers of modern architec-

ture first demonstrated the possibilities of the curtain wall, it is barely five since it has become commercially available. It is, nevertheless, the most dramatic and visible aspect of the slow industrialization of building techniques, and, as such, has acquired an almost symbolic status. But it presents its own special problems as well as such conspicuous virtues as speed of erection and lightness of structure, and in the first part of this extended survey of curtain walling, Messrs. Brawne and Craig discuss the practical aspects of the method as it affects the working architect, with particular attention to the dominant questions of the performance of jointing materials and joint-types, the various structural sections available and the behaviour of the now widely differing infill panels that can be employed. On this basis of practicality they then consider the potentialities of curtain walling as a building technique in development, and make an assessment of the relative merits of the different systems currently available 'off the peg' in Britain.

## 188 Shepton Mallet by Gordon Cullen

In this, the second of the REVIEW's series of townscape studies undertaken in the West Country in association with Bristol University, Mr. Cullen considers the case of a town whose elements are simple enough, but assembled in a manner that gives them an unique quality. Quite apart from the subtleties of grouping of those major features which focus the Market Place and make it the town's outdoor room, the Lower Town, though it flanks the High Street on both sides with its own pattern of lanes, squares and pedestrian ways, enjoys the continuity of this pattern by an underpass below the High Street. Thus a main shopping street and the residential area it serves can lie in the closest proximity to one another without being mutually destructive, and the real nature of a compact small town is accentuated and enlivened.

## 194 House at Watford, Herts: Architects,

*Alison and Peter Smithson*

## 198 A Roman Church in Yorkshire by

*Hugh Honour* The *Album di Roma* is not a customary source for information on churches in Yorkshire, but the magnificent chapel adjoining Everingham Hall justifies a place in it by virtue of its architectural quality as well as its denominational connections. Presumably finished in 1839, it is a building of an entirely Roman character, columniate and vaulted within, illuminated by windows above the cornice and the oculus of its domical apse, and lined with niche'd statues between the columns of either wall. The statues are the work of Leopoldo Bozzoni, the fine plasterwork was produced by Crabtree's of York, and the design of the building as a whole is open to debate. Mr. Honour, however, sets out the evidence for supposing that Agostino Giorgioli gave the basic sketches, and John Harper altered them in working them up for building. But

whatever the correct attribution, the chapel—barely altered since 1840—is a notable monument to the first years of Catholic emancipation.

## 201 Current Architecture

### Miscellany

## 203 Books

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## 206 Exhibitions

## 208 Counter-Attack

### Skill

## 209 Interiors: S.S. 'Israel' and S.S. 'Theodor Herzl' Architects, Dora and Yeheskiel Gad; Al Mansfeld and Munio Weinraub

## 212 Techniques: Panel Infillings

### The Industry

## 220 Contractors

**The Authors:** *Osbert Wyndham Hewett* was educated in England; New Zealand—where he acquired a passion for Victoriana; South Africa—where a classmate for years was Bill Holford, and Trinity Coll. Dublin. In the early thirties he opened Peter's Bar in a sixteenth-century palazetto in Ragusa-Dubrovnik; speaking eight languages he wandered round Europe, spending two years in Germany loathing Nazism, and opening English Clubs. Lured for the British Council in Sicily, Greece and Turkey on the Victorians; in the war, a commission in the R.A.F. landed him into a gaggle of archaeologists instead of pilots. Is now editing a Victorian diary, lecturing and broadcasting on the Victorians. *Michael Brawne* studied mathematics and physics at Edinburgh University before serving in the R.A.F. as a meteorologist; since then his architectural education has consisted of studying at the A.A. from 1948 to 1953, at M.I.T. from 1953 to 1954 on a Smith-Mundt fellowship, being married to a town-planner and having two children. At M.I.T., where he got his M.Arch., he worked out a system of prefabrication and in the following year he was on the Research and Development staff of a major curtain wall manufacturer in California. He is now with the Architects' Co-partnership. *Alan Craig*, born 1925, educated at King's College School, Wimbledon and the A.A. School. Awarded the Building Centre Scholarship 1950. Works for James Cubitt and Partners and is at present helping to build up the firm's Nigerian office. *Hugh Honour* was born in 1927, educated at The King's School, Canterbury and St. Catharine's Coll., Cambridge; at the Leeds City Art Gallery and Temple Newsam House for a year, and now lives in Italy working on a long-term study of Italian sculpture of the seventeenth and eighteenth centuries, and meanwhile writing a book on European Chinoiserie; has contributed articles to *The Connoisseur*, *Country Life*, *Apollo*, *The Antique Collector* and *The Burlington Magazine*.

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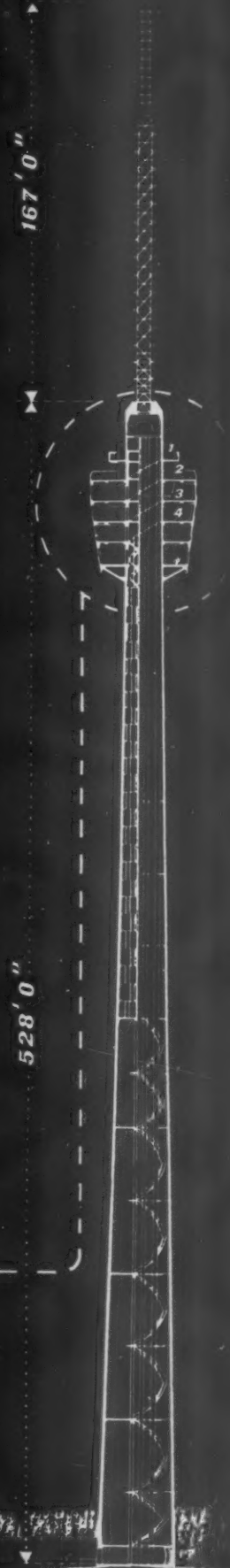
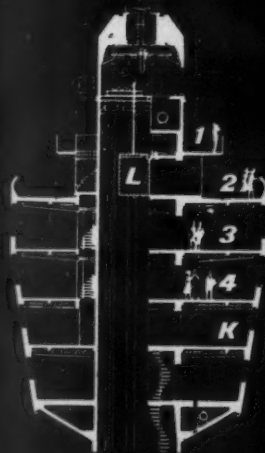
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The *Stuttgarter Fernsehturm*, designed by Fritz Leonhardt, is more than the television-mast of *Süddeutsche Rundfunk*, for at the top of the main 528 foot concrete tower, just below the mounting of the transmitting mast, are viewing platforms, 1 and 2, in section above, and a two-storey restaurant, 3, 4, commanding enormous panoramic views over Stuttgart and its surroundings.

PROJEKT: F. LEONHARDT  
 ARCHITECT: F. LEONHARDT





## THE WALDEGRAVE STRAWBERRY HILL

When at the beginning of 1856 Frances, Countess Waldegrave began to restore Strawberry Hill, the house had been lying derelict since the sale in 1842. Her second husband, the seventh earl, furious with the Twickenham magistrates for having committed him to the Assizes for a drunken brawl,<sup>1</sup> had determined to leave the rotting lath and plaster walls of Horace Walpole's villa as a reminder of their ingratitude to the Waldegrave family. His widow had sometimes held a picnic there during the summer, but one of her guests in April, 1854, considered that 'its end is near at hand.'<sup>2</sup>

After eight years of childless marriage, Lady Waldegrave's elderly third husband, George Granville Harcourt, felt that some preparation should be made for a home for her eventual widowhood, since his own estate at Nuneham Park would pass to his brother. It was not, however, of such a contingency that Frances herself was thinking. Nuneham Park was a pompous, classical mansion, and its chilly, rather shabby splendour never attracted her. With twenty thousand a year of her own, Frances was the most hospitable woman of her generation, and loved to fill her houses with crowds of young people. It led to endless quarrels with Mr. Harcourt, but with a home of her own as near London as Strawberry Hill she could give the gayest of parties the whole season.

The clerk of the works for the Nuneham estate, Mr. Ritchie, must have been an extremely able man; for to him the plans for the restoration were apparently entrusted. By the beginning of March, Messrs. Cobb, builders, were busy 'putting up a new set of battlements, patching up pinnacles, etc.,'<sup>3</sup> while indoors Battam, the decorator, and Nosotti, the glass man, were working to get the place ready for the first party in June.

The party was an immense success. All her friends were enchanted with the alterations, and crowded to visit her for the rest of the summer. It soon became obvious that Walpole's toy castle was far too small to accommodate even the more intimate of her friends. Lady Waldegrave therefore decided to have the stables converted into bedrooms,<sup>4</sup> and a temporary passage built to them<sup>5</sup> until such time as she could arrange for the suite of vast reception rooms<sup>6</sup> she planned—all to be slightly

larger than those at Nuneham to put Mr. Harcourt in his place.<sup>7</sup>

Messenger, the great oarsman who held the title of Queen's Champion, was commissioned to build the best of all boathouses,<sup>8</sup> and to accommodate visitors' servants Frances ordered one of those iron houses (the Mid-Victorian version of a pre-fab.), which were being extensively bought by emigrants to the colonies.<sup>9</sup>

Horace Walpole had claimed that 'the chief boast of my collection is the portraits of eminent and remarkable persons'<sup>10</sup> an idea which appealed to Frances. Sant, the fashionable portrait painter of the moment, was set to paint all the more beautiful of her women friends for the Gallery at Strawberry Hill. In the autumn she dragged old Mr. Harcourt over to Paris to buy furniture and a parquet floor for this gallery,<sup>11</sup> which she was having redecorated and the walls hung with crimson silk.<sup>12</sup>

The library was also redecorated, and, early in 1857, the gold stars and Frances's monogram painted on the ceiling of the great staircase.<sup>13</sup> The chapel was restored the following year,<sup>14</sup> but it was not until 1860 that the plan for the great new suite was again discussed.

Mr. Harcourt did his best to restrain his wife's reckless extravagance. He was a shrewd business man, and realized that few estates could stand the strain of the sudden call she was making upon hers for tens of thousands of pounds. Unfortunately he was too inclined to curb her in endless petty ways,<sup>15</sup> and so, when he preached caution, she simply thought it was yet another attempt to be a wet blanket. The news that her coal mines at Radstock were doing capitally,<sup>16</sup> thanks to a hard winter, came at just the moment to encourage her to ignore her husband's arguments. At Nuneham she scarcely improved the old man's temper by announcing that

'I cannot say how shabby and uncouth I find this place after old Strawberry . . . it is fortunate I have no children as I am sure they would all be marked with a Strawberry.'<sup>17</sup>

From her mother, who in 1835 had built the Saint James's Theatre, Frances inherited a passion for building, and was constantly either building or planning new buildings on her Essex and Somersetshire estates as well as at Twickenham.<sup>18</sup> In June, 1860, Lady Waldegrave found herself with £20,000 with which she had intended to pay off a mortgage. However, the mortgagor was prepared to renew the bond, so Frances at once decided to build at Strawberry.<sup>19</sup>

The temporary passage between the Round Tower and the West Wing was to be replaced by a large ante-room opening into the great new drawing room, and into a passage leading to a large dining room and to the bedrooms built in '56. On the ground floor were to be new kitchens and servants' rooms. Kelk was the builder Frances was now employing, and it was his foreman, Chapman,<sup>20</sup> together with the Nuneham clerk of the works Ritchie,<sup>21</sup> and Lady Waldegrave herself,<sup>22</sup> who drew up the plans. Chichester Fortescue, the devoted Irishman who was to become her fourth husband, wrote in his diary on November 1 1860: 'Ritchie came with improved plans for her new rooms, the dear lady was delighted and very angry with me for advising her to consult a good architect such as Burns.'<sup>23</sup>

Meanwhile the old high road had been moved back some distance to provide a more dignified approach,<sup>24</sup> and it was decided to convert Walpole's 'Abbot's Garden' into a large entrance hall.<sup>25</sup> By the end of November Frances was 'rather frightened at the expense of her S.H. building,'<sup>26</sup> which is scarcely surprising since altogether she spent over £100,000 on her alterations to Strawberry Hill.<sup>27</sup> Fortescue's sister had married David Urquhart, the eccentric publicist who re-intro-

<sup>1</sup> C. Fortescue's diaries, November 2, 1860.

<sup>2</sup> C. Fortescue's diaries, August 16, 1856, and May 9, 1857.

<sup>3</sup> See Middlesex by Norman G. Brett-James, Hale, 1951, p. 195.

<sup>4</sup> Letter from Lady Waldegrave to Fortescue dated November 24, 1856, and letter from Miss Bolton to Lady Waldegrave dated March 13, 1857.

<sup>5</sup> Nearly a hundred years later—during the summer of 1955—it was again redecorated. This recent restoration owes a great debt to the Ex-President of the Royal Academy, who has generously devoted a considerable amount of time to helping the present owners to maintain the whole place so perfectly.

<sup>6</sup> Letter from Lady Waldegrave to Fortescue dated February 2, 1857.

<sup>7</sup> C. Fortescue's diary, March 14 and May 23, 1858.

<sup>8</sup> See 'Strawberry Fair' Chap. 10. (This Osbert Wyndham Hewett's biography of Lady Waldegrave, was published by John Murray in 1956.)

<sup>9</sup> Letter from Lady Waldegrave to Fortescue dated November 21, 1856.

<sup>10</sup> Letters from Lady Waldegrave to Fortescue dated December 8, 1856, and January 23, 1857.

<sup>11</sup> For an account of building activities elsewhere see 'Strawberry Fair.'

<sup>12</sup> C. Fortescue's diary, June 5, 1860.

<sup>13</sup> C. Fortescue's diary, November 2, 1860, August 23, 1861, and March 2, 1862.

<sup>14</sup> C. Fortescue's diary, November 1, 1860, December 24, 1860, and letter from Lady Waldegrave to Miss Bolton dated December 5, 1855.

<sup>15</sup> C. Fortescue's diary, June 10, June 24, November 2 and November 11, 1860.

<sup>16</sup> C. Fortescue's diary, October 14, 1860.

<sup>17</sup> Undated letter from Fortescue to Lady Waldegrave and a letter from Ward Brahm to Lady Waldegrave dated September 18, 1861.

<sup>18</sup> C. Fortescue's diary, November 26, 1860, and August 20, 1861.

<sup>1</sup> See *Times*, July 1, 1840, April 30, 1841, May 4, 1841.

<sup>2</sup> C. Fortescue's diaries, April 9, 1854.

<sup>3</sup> C. Fortescue's diaries, March 6, 1856.

<sup>4</sup> C. Fortescue's diaries, July 21, 1856.

<sup>5</sup> C. Fortescue's diaries, October 2, 1850, and May 2, 1857.

<sup>6</sup> Letter from Lady Waldegrave to Fortescue dated August 25, 1856.

duced the Turkish bath to England, and in her Christmas letter to Fortescue that year Frances wrote: 'I wish very much that you would get a design from your beau-frère of the plainest possible Roman Bath. I have spoken to Ritchie about it, & he is all for having one on the ground floor of the West wing.'

The following August Lady Waldegrave and Mr. Harcourt set off on a continental tour to buy furniture and other things for the new rooms, but a few days before they left, Frances was able to show some more intimate friends the half-finished rooms. 'Met Lady W. on the road . . . then was taken at once, & solemnly to see the "new room" & everything else. She was full of it. I was first shown the outside, the great Oriel Window etc.—and then the inside—we were a long time in the room, & twice we all marched in procession from her little sitting room through the gallery to the end of the new room.'<sup>25</sup>

While Frances was busy buying parquet in Vienna,<sup>26</sup> and sculpture such as Magni's charming 'Reading Girl' in Florence,<sup>27</sup> progress reports were regularly sent her. She had commissioned Henry Phillips to do a series of paintings for the great drawing room, and Fortescue wrote to her at Geneva: 'Yesterday I

took Phillips down to old Strawberry . . . and we were a long time with Chapman over his plans, and in the great room. Phillips was very much pleased with Chapman who got on capitally with him, and is to be at his studio today to measure the pictures etc. P. was delighted with the room, wh. is a much finer thing than he expected, and made him very proud and more anxious than ever to do it and you justice. Altogether it was a most satisfactory consultation and just at the right time, to secure the harmonising action of architect & artist. . . . The carpenters were putting up the timbers of the roof.'<sup>28</sup>

A month later her youngest brother in a letter to her at Vienna reported: 'Mr. Chapman says, the foundations of the screen are in at the principal entrance and the masonry is being fixed. The whole of the masonry is fixed in the Drawing room front and looks "crumocious"—(that is magnificent, beautiful). The lead gutters are fixed on the Drawing room and the slaters are putting on the slates.'

'The walls of the new rooms in the Tower are built and the masons are fixing the new windows—the carpenters are forming the new staircase to round tower, the roof of the dining room is all boarded in and wood gutters are laid and the masons are fixing the parapet cornice over dining room windows. The new

clock turret is built and the carpenters are putting the roof to it—the turret looks charming. The whole of the roof is on the kitchen—the area walls are built and the new coal vaults also,—and that's all.

Your aff. Brother

Ward Braham.'<sup>29</sup>

On her return to England, Frances immediately went down to Twickenham. Fortescue accompanied her and 'went about with Lady W. to see everything—heard all her observations and plans & shared her delights and admirations. She hit upon the blot of the new building, its lowness below the level of the ground, and ordered further excavation to be begun at once. She was very much pleased with the carving of the shields etc., and the man Plows who carved them.'<sup>30</sup>

In December, 1861, old Mr. Harcourt died at Strawberry Hill and for some time Frances could not bring herself to visit it. However, she found that her position as a great political hostess was in no way diminished by her widowhood, and that even in the country she could not escape endless visitors. By June, '62, Strawberry Hill was ready for the first large party her acquaintance forced her to give. With the exception of the billiard room, which was added in 1873, she made no further alterations.

Chichester Fortescue's devotion of eleven years was rewarded in January, '63, when he became her fourth husband. For the next sixteen years Strawberry Hill played probably a more dominant role in Victorian political and social life than even Windsor. So famous did the parties there become that the *chef du protocol* usually expected Frances to entertain any visiting foreign royalty there, while the annual balls for the Prince and Princess of Wales were among the most important features of the London season. To cope with the floods of guests the Southern Railway built Strawberry Hill station, and all were enchanted with Frances's riverside home. There was only one slight shadow on Lady Waldegrave's own happiness. As she expressed it to her greatest friend: 'Strawberry is more like a fairy palace than ever. This sounds like boasting of my handy work, but I feel inclined to do so, as I now constantly find young people thinking that Horace Walpole made *all* my pet creations & they only wonder that he should have had the reputation of making a mere lath and plaster house.'<sup>31</sup>

<sup>25</sup> Letter from Lady Waldegrave to Lady Strachey dated June 13, 1876.

Most references in these notes are to the diaries of Chichester Fortescue, later Lord Carlingford, and to the correspondence of Lady Waldegrave, in the possession of Lord Strachie, all unpublished except for the material used in my biography of Lady Waldegrave, 'Strawberry Fair'.

<sup>26</sup> C. Fortescue's diary, August 17, 1861.

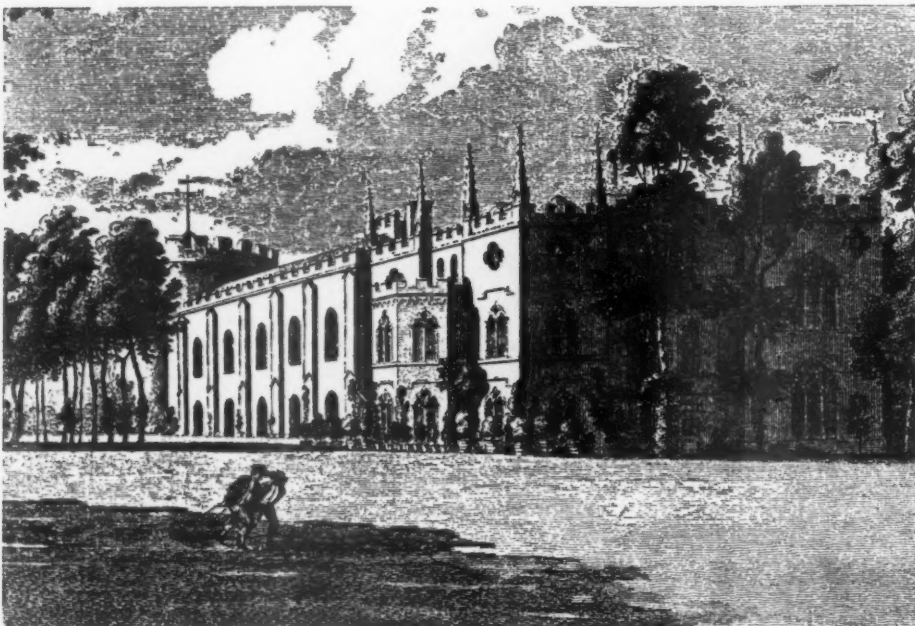
<sup>27</sup> Letters from Fortescue to Lady Waldegrave dated September 11 and 19, 1861.

<sup>28</sup> C. Fortescue's diary, October 19, 1861.

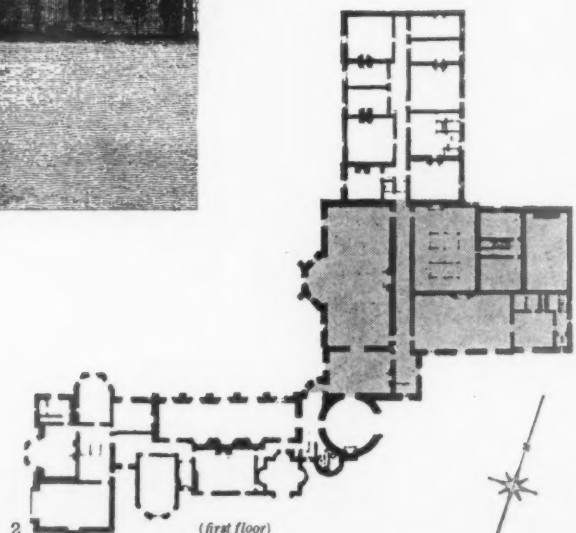
<sup>29</sup> Letter from C. Fortescue to Lady Waldegrave dated August 23, 1861.

<sup>30</sup> Letter from Ward Braham to Lady Waldegrave dated September 18, 1861.

<sup>31</sup> C. Fortescue's diary, November 20, 1861.



Horace Walpole's Strawberry Hill, 1, forms only a small part of the present bulk of the building (now a seminary) and Frances Waldegrave's additions, shown shaded in 2, were larger in area than the original house. The largest single room in her additions were the drawing room, whose grandly foliate fireplace is seen in 3, and junction with the older work was effected by an ante-room whose radiator is seen in 4, and garden steps in 5.



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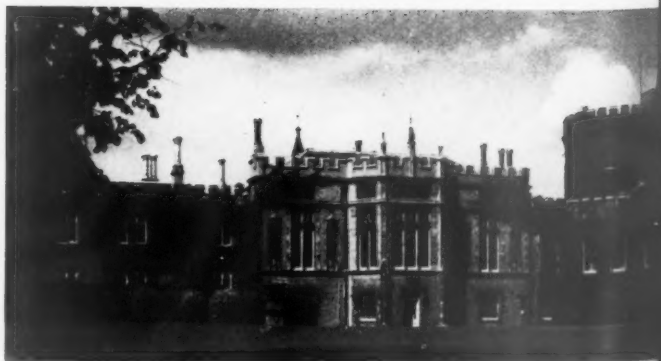






6

*The Waldegrave ante-room at Strawberry Hill was connected to the the Walpole wing by a curved passage that by-passed the great Round Room under the tower, and can be seen beyond the door on the right of 6, while its windows appear below the tower in 7, above the garden stair. The new drawing-room, which occupies the centre of 7, was fitted between the original building and its stables, and the latter, converted into bedrooms at the same period, can be seen to the left of the drawing-room façade.*



7

## THE WALDEGRAVE STRAWBERRY HILL

Waldegrave detailing at Strawberry Hill comes surprisingly close to Walpole's in spirit, but the sensibility of a later age manifests itself in a bolder modelling and richer individual forms. This detailing is sufficiently consistent to set a style for most of the new work—the panel treatment of the

main doors of the drawing-room, 8, is substantially repeated on the passage doors, 9, but this close-up also shows the softly naturalistic running ornament in the door jambs which is very far from Walpole in spirit. The dining room, which lies across the corridor from the drawing-room, has a more Jacobean treatment, particularly in its ceiling, 10, and elaborate ogee pelmets above the windows.



8



9

10



**SCHOOL AT SYDENHAM**





2

This school for the LCC converts an existing girls' secondary school into a comprehensive by adding 1,140 places in the same way as Mayfield School, Putney (AR, March, 1956). The six-acre site is on the east slope of Sydenham Hill, with a 22 ft. fall from west to east: the east boundary is a busy traffic road, Dartmouth Road. The maximum area of open space was preserved by having an E-plan six-storey classroom block connected by a two-storey link to the three-storey administration

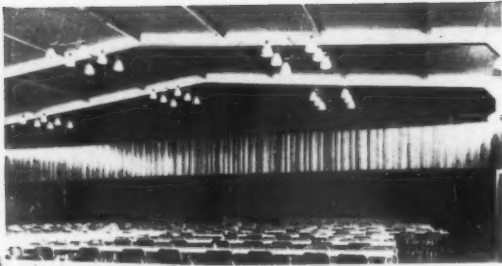
block; the classroom block is downhill of the other blocks, on r.c. columns which provide shelter space and cycle stores underneath, thereby placing the main classroom floor on the same level as the assembly hall and gymnasium at the high end of the site.

The classroom block has r.c. construction on an 82 in. module, with 2 ft. thick vibrated concrete raft at 12 ft. above ground level on in-situ tapered columns. The south elevation above the raft is in 6 in. by 10 in. precast

1. facing page, the entrance and entrance foyer, which is supported on precast columns, and on the right, the stone-faced wall of the assembly hall. 2. above, the biology pool, seen from the glazed link between the administrative and classroom blocks. 3. the classroom block from the south-east: the walls to the upper three floors being flush and the lower two inset is accounted for by the fact that the LCC education department stipulated for an extra classroom on each of the lower two floors after the main frame was on site and the precast mullions had been manufactured. Hence the partitions are not immediately behind the columns, each classroom occupying 2½ bays instead of 3 bays. The deck at the west end is for outdoor teaching, and access is from the classrooms only: the projecting box on the fourth floor contains a balcony for the housecraft demonstration flat which was extended, for æsthetic reasons, to include part of an adjacent housecraft classroom.



3



4. looking towards the gallery at the east end of the assembly hall, which is fronted with natural-finished hardboard. 5. looking down from the



mezzanine bridge, seen from below in 6, towards the foyer between the hall and the outdoor terrace on the south. 6. the entrance foyer, which is paved with Derbydene stone slabs; the bridge leads from the administration wing straight to the assembly hall gallery. 7. the south-western corner of the classroom block.

# **SCHOOL AT SYDENHAM**



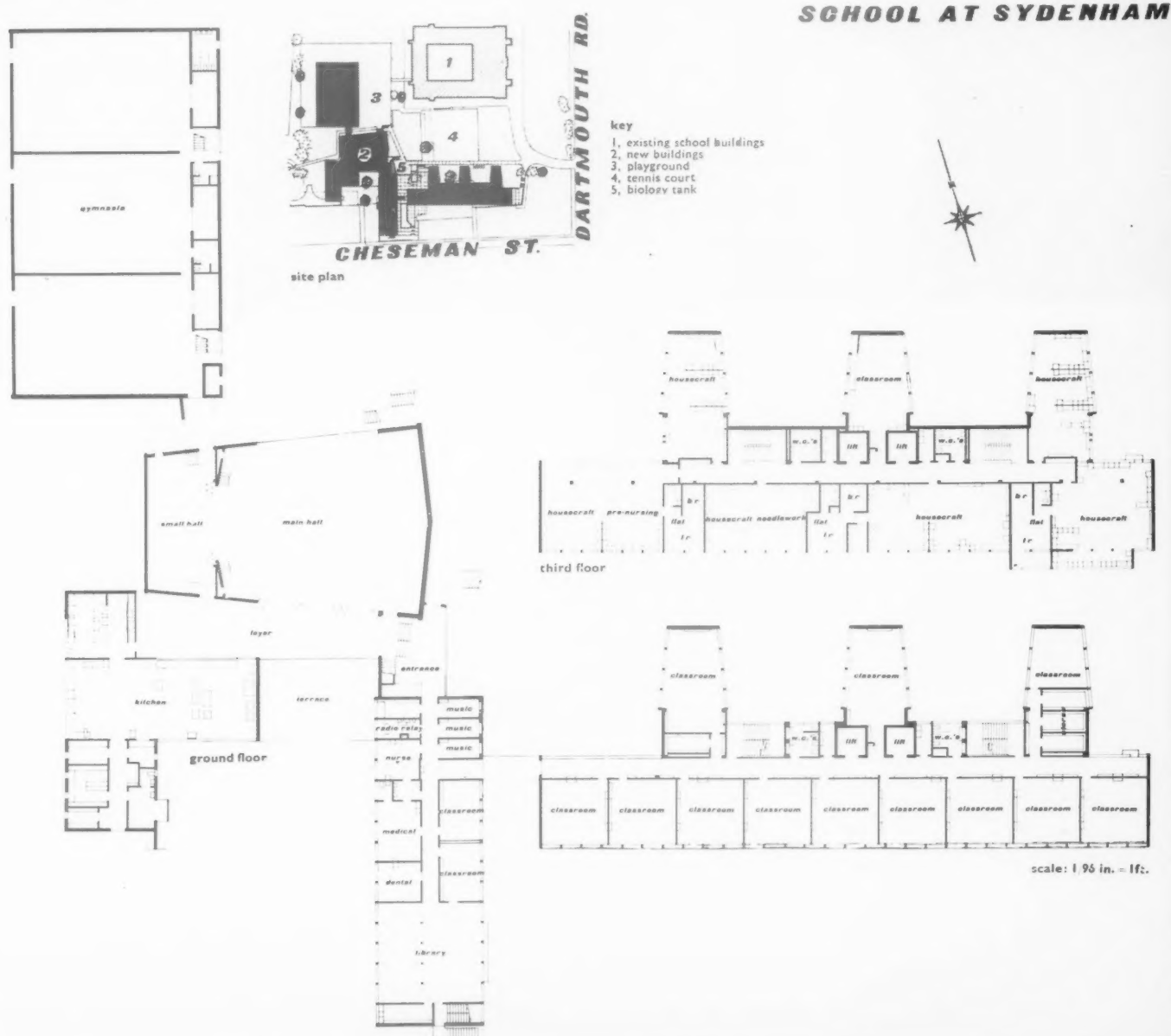
concrete columns in two lengths, with 5 in. thick gable end walls faced with Derbydene stone; hollow tile and reinforced concrete floors and roof with spine columns and beams between rooms and corridor. The tapering five-storey annexes on the north side are similar, with mass concrete and r.c. strip foundations, column bases and retaining walls, the latter faced with granite setts. The external walling to the south side and sides of annexes consists of galvanized steel windows with cavity spandrel walls consisting of 1½ in. precast concrete panels with exposed aggregate tied back to a 3 in. breeze block skin. The north wall of the main block consists entirely of special metal window sections between metal T-shaped mullions which are fixed back to the edge of

the floor slabs. Spandrel walls of 4 in. breeze block are cement rendered externally and painted to show as coloured panels. The administration block uses the same module with gable ends in 11 in. cavity brick and spandrel walls in 8½ in. cavity construction with 4½ in. red facing bricks externally. The gymnasia are steel framed, part in two storeys with an in-situ r.c. first floor supported on 11 in. cavity brick walls and 6 in. diameter precast concrete columns; the assembly hall is also steel framed, with exposed portal frames diminishing in over-all width towards the stage, faced with 1½ in. Derbydene stone slabs at the east end and 11 in. cavity brick elsewhere. The entrance foyer is steel framed with in-situ reinforced floor, incorporating a bridge at mezzanine level connecting the gallery with the administration

block. The schoolkeeper's lodge is a two-storey structure in load-bearing cavity brick with purple/black facings and vertical wood boarding in window spandrels.

The floor finish in all classrooms is 3/16 in. lino tiles in a range of mottled colours, one colour to each room; the corridors generally are in thermoplastic tile. The assembly hall and housecraft flats are finished in muhuhu blocks and the gymnasia in maple strip. The entrance foyer is in Derbydene stone paving. Main stairs have precast granolithic treads with blue terrazzo risers and stringers.

Walls generally are plastered with plastic emulsion finish; wall papers are used in the foyers, staff rooms and library, and perforated hardboard in natural finish gives an acoustic absorbent to back wall of the hall.





Curtain walling in England owes its origins to patent glazing far more than in any of the other industrialized countries in which curtain walling is indigenous. Patent glazing, that is to say the methods of puttyless glazing patented from the mid-nineteenth century onwards, tried after all to solve much the same problems on the roof that curtain walling attempts on the wall. The principle most applicable in the new context was, of course, the mechanical joint between the glass and the bar which kept most of the rain out, but had, as a kind of secondary defence, a grooved drainage channel in the glazing bar which also took away any condensation from the inside face of the glass. The principle is perfectly sound as long as the bar remains continuous, and the horizontal joints weather themselves through overlaps like fish scales. When horizontal members are inserted in the same plane as the mullion, difficulties arise and most of the weaknesses of the systems based on patent glazing occur here. It must, nevertheless, be recognized that this principle of the mechanical joint and the internal drainage channel is an important contribution to curtain walling technique. On the pages that follow Michael Brawne and Alan Craig survey current curtain wall problems and products with special reference to Great Britain.

Michael Brawne and Alan Craig \*

# WALLS OFF THE PEG

## AN ANALYSIS OF BRITISH CURTAIN WALL SYSTEMS

It is just under half a century ago since Walter Gropius sheathed the Fagus Works in a curtain wall of metal and glass—an enclosure which he himself described as 'restricted to that of mere screens stretched between the upright columns of the framework'. Since that date the curtain wall has become the accepted and demanded idiom of contemporary architecture. In the States, as was demonstrated in the May number of the 'Review', it has almost become synonymous with it. And yet in that half century the curtain wall has not changed a great deal; it has in the last five years merely become commercially available—surely an inordinate time lag between prototype and production model.

The curtain wall is, of course, merely one manifestation of the very general movement responsible for the industrialization of building. It is, however, a highly visible and dominant manifestation which has acquired an almost symbolic quality. The curtain wall, more than any other element, has become the stylistic mark of industrialised architecture at its present stage of development and its success can undoubtedly be attributed in large measure to this emotional appeal; this inherent rightness of the lightweight enclosure sheathing the sparse load-bearing skeleton. The answer it provides is so strictly rational that it evokes an emotional response.

It has only recently become possible to translate this emotional appeal into building reality because only in the last few years has the material-to-labour ratio changed to such an extent that the curtain wall made sense in terms of economics.

In the article which follows we discuss in the main section the inherent technical

\* The research on the curtain wall systems was done jointly by the two authors; the article itself was written by Michael Brawne.

problems as they seem this side of the Atlantic, and in the second section we line up the proprietary systems which can (or which could at the time of writing) be bought 'off the peg' in this country.

In terms of material, two of its great virtues—thinness and lightness—can seldom be fully exploited in this country. The back-up wall or the projecting ledge required by fire laws destroy any gain in usable floor area, and therefore annual return from additional rent, which might otherwise have been achieved. The reduction in structure and foundations which the light weight of the wall brings about becomes appreciable in any significant sense only on quite tall buildings, and we have not yet been allowed structures of twenty storeys or more. It does seem strange, however, that a number of relatively tall office buildings now being planned do not use curtain walling. The most conspicuous and controversial amongst these is undoubtedly Sir Howard Robertson's project on the South Bank where it would seem that a large corporation does not wish to advertise itself through an architecture as technologically advanced as its products.

The great economic virtue of the curtain wall is undoubtedly its rapid installation. The bulk of the time and effort required to produce the wall are spent in the factory where the best use of manpower and machines can be made, and where a precision product can be created under close control. Precise elements are, of course, required because only these can be assembled speedily and easily on the site. Rapid site erection has a number of important results. The most significant is the much earlier occupancy which becomes possible. For one group of office buildings in Pittsburgh it has been computed that a brick and masonry cladding would have taken six months to complete; the erection of stainless steel panels took three weeks. The additional rental which this shorter construction period made possible was just under two million dollars. It is interesting to note that the saving in the structural skeleton due to the difference in weight between masonry and panels on the same project of office buildings 19 and 23 storeys high was only a sixth of that figure. The quickest possible construction time is, however, not only of interest to those renting office space but also to those financing the building. Investment companies are always anxious that their capital should not be tied up for any length of time, for the loss of interest on investment during construction can be quite considerable.

In this country curtain walling has so far been used most frequently on schools where the same economic arguments of rental do not apply yet early occupancy is of course just as important, and it is probably true to say that without some such speedily erected form of cladding the great school building programme of the post-war years could not have been

accomplished. This is especially so as a large number of these schools have been built in areas where building labour is extremely scarce, and it is significant that some of the earliest uses of curtain walling on any scale have, both in England and America, occurred in areas where there had previously been little building and there was, in fact, a labour shortage—Chaddesden Secondary Modern School by the Architects' Co-Partnership (AR, July, 1955) is built in Derbyshire, Pietro Belluschi's office block for the Equitable Savings and Loan Association built in Portland, Oregon, in 1948 (AR, December, 1948; see also AR, May, 1957), is in the Pacific North West.

In the nine years that have elapsed since Belluschi's elegant aluminium cladding was put up in the centre of Portland, the manufacture of curtain walling has become a considerable industry. In this country there are about twenty manufacturers, mostly established producers of metal or wood windows, or of patent glazing, who have recently added a number of sections to their range which form mullions, transoms, cills, covers, etc., and which together with their windows provide a curtain wall. In other cases makers of infilling panels or of sheet metal work have taken up curtain walling. Several of the producers export their cladding and most will also install it, a course to be highly recommended.

Although the principle of the curtain wall has respectable nineteenth century origins, its full scale manufacture is a matter of the last few years. It is thus, as most manufacturers will agree, still at a very primitive stage of development, with its many inherent problems not yet solved and many of its potentials not fully exploited.

### *The problems the joint*

The curtain wall, as we know it at present at any rate, is an impervious skin stretched over a building. Most of its problems arise from this simple fact. None of the rainwater is absorbed and so very large concentrations of water may occur at any one point. These may easily, especially with wind pressure behind them, find their way through the skin at a joint. The Building Research Station has shown in its Digest on light cladding, the first part of which has just been published, that in a heavy rainstorm about one gallon a minute will run down every hundred square feet of vertical surface exposed to the rain. It is not surprising, therefore, that most thought devoted to curtain walling has up to now concentrated on the problem of the junction.

Two broad categories of joint seal can be distinguished: rigid and non-rigid. The

rigid joint such as welding or glueing can seldom provide all the answers. Even if the design allows for movement of the cladding in folds of the material rather than at the joints, a perfectly feasible design with sheet metal, for example, it is rarely possible to weld or bond all the joints of the cladding after it is in place. A great many more joints could, of course, be fixed rigidly than is the case at present—the corners of metal windows are welded, the corner junctions between mullion and head in the curtain walling grid are not. This is especially true as the epoxy resin-based adhesives make metal to metal bonding a feasibility. Such rigid fixing only demands an even further concentration on shop fabrication.

It is the non-rigid joint which is the weakness of the system. Four types can be distinguished:

1. **mastic** This is probably the commonest sealer and in many ways the least satisfactory. The traditional oil based putty, a form of mastic, was only sound as long as it was kept painted. On curtain walls which often do not need painting, it soon fails. The same is true of many other mastics which, although not oil-based, only retain their elasticity for a limited period. Most are liable to erosion by wind and water and a number fail under direct ultra violet light.

Makers of mastics, like paint manufacturers, seem peculiarly reluctant to divulge the chemical base of their product or to publish any data on its physical characteristics. Such phrases as 'a specially prepared compound of unique properties' assume an excess of simple-minded trustworthiness on the part of architects.

If mastics are specified they should, whenever possible, be placed in positions which are shielded from both sun and extreme exposure, 1, and where they are not liable to be sheared by the movements of the joint.

The most hopeful development in this type of joint is the use of a polysulfide synthetic rubber which is known by its trade name of 'Thiokol.' Strictly speaking this is not a mastic but a liquid polymer which, when compounded just before use with a curing agent such as lead oxide, forms itself without shrinking into a resilient rubber. Its properties are, in many ways, remarkable. It has adhesion in shear of at least 200 psi to aluminium, steel, glass, concrete, plywood, asbestos, brick and stone; it



1, two panel joints in which the mastic is fully protected from exposure.

shows no water absorption after being immersed for four days at 80°F, and, most important of all, it can be elongated 200 per cent before breaking. Accelerated weathering tests which included exposure to ultra violet light and salt spray indicated a durability of 30 to 35 years without significant change. The material has for some years been employed in the aircraft industry both here and in America and has recently been used on curtain walling in the States. Lever House was not long ago entirely recaulked using 'Thiokol.' A number of British curtain wall manufacturers are at present experimenting with the compound and should soon be in a position to supply it as their standard joint sealer.

**2. gaskets** These have, of course, been in use for a long time in the automobile industry but are relatively new in building. Every car windshield is weathered by an extruded gasket and in view of the extreme wind pressure which it may experience it is really a remarkably tight joint. Gaskets for curtain walls have been extruded from a number of plastics, the commonest being neoprene and vinyl. The curtain wall on Saarinen's General Motors Technical Centre (AR,

May, 1957) uses an ingenious neoprene gasket, 2, which grips the panel around its edge. A more common gasket consists of a hollow vinyl tube which seals the joint through being compressed against two planes, 3. At the corners the tube can be made continuous by being cut with a hot blade on the mitre and on making contact the two tubes will fuse. The great virtue of gaskets is that quite complex shapes can be extruded, both hollow and solid, with varying wall thicknesses giving different degrees of resilience and that, moreover, the die costs are relatively low. It is often quite easy to hold such gaskets in grooves which have been extruded in the aluminium section, 4. Such closures are frequently used on windows in air-conditioned buildings to reduce air infiltration. The latest curtain walling system to be developed in this country uses such

an extruded gasket to seal both the glass and panels and is illustrated later.

**3. cover tapes** These are usually impregnated fibre tapes which will bridge a joint and if kept under pressure remain watertight. They can also be used between materials which fit tightly, for example in the corrugations of aluminium sheeting

and will, as long as they are under pressure, provide a seal, 5. They have so far been used rather more in the construction of caravans

and similar coachwork than on curtain walls but their use should certainly be investigated further in building construction. Their ease of application is a point greatly in their favour.

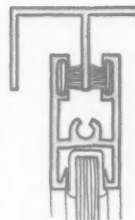
**4. spring stops** A number of forms of this particular seal exist. The most obvious is the spring clip which holds the glass tight in certain forms of patent glazing, 6. The bent cover strip which

is used on one English curtain walling system also comes into this group, 7. The same is true of various interlocking joints between metal sheets which depend for closure on the spring action of the material, 8. The great weakness of the spring clip is at the corner where its continuity is broken. Patent glazing rather neatly solves this problem by never making the clip change direction.

A very similar spring action is to be found in the closure given by mohair strip. This strip is the familiar lining of most car win-

dows. It is also a common seal on steel or aluminium sliding doors. The strip consists of a short mohair pile on a woven backing or in a plastic cord. To give rigidity to the strip it is further backed by a very thin sheet of metal. The elastic tufts of the pile are slightly depressed and give an extremely tight seal unlikely to deteriorate. Such a closure from an aluminium sliding door is shown in 9.

It becomes obvious that many alternative ways of achieving a weather-tight joint can be devised. Only a few have so far been tried on curtain walling, and a great deal of experiment remains to be done. The assumption that a curtain wall is only a series of windows which



9, metal backed mohair strip held in grooves extruded as part of a sliding door head member. The spring action of the slightly compressed tufts provides an extremely durable weather-tight closure. This extruded aluminium section also shows the great versatility of such profiles: two grooves hold the mohair strip, the central three-quarter tube takes a self tapping bolt at each end to form a corner connection and the lower channel holds the glass and its vinyl seal.

can be sealed traditionally with putty-like compounds has been proved erroneous and new methods must be found by the manufacturers of this new product.

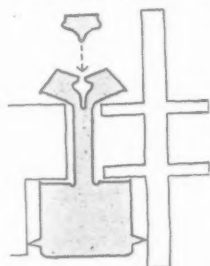
## materials

After the joint, probably the next most important problem has been the material of the curtain wall. This is, of course, as much an economic and visual question as a technical one. The cost figures given with the system described later amply demonstrate this: other things being equal, a grid in ordinary mill finished aluminium is about 40 per cent more expensive than that in galvanized steel, and again, the opaque appearance of a coloured metal panel is very different from the translucency of cast glass. The choice of material, unlike perhaps the detail treatment of the joint, is moreover still very much an architectural responsibility. Few manufacturers are in fact able to give really unbiased advice on this choice, for most have a vested interest in one material or another.

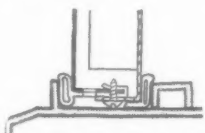
Metal, wood, glass and plastics have up to now been the materials most used on curtain walling. No single material has yet probably answered all the exacting needs of strength, durability, colour, texture, cost and so on. Perhaps none ever shall, though it must be remembered that chemistry has only very recently turned its attention to building materials and there is no reason to suppose that the effect of such research into cladding will be any less spectacular than it has been in textiles, for example.

## 1. metals

(a) **steel** Carbon steel has for long been used in the making of windows and its extension to curtain walling seems natural. It, of course, suffers from two serious drawbacks: it rusts and has a limited number of feasible shapes. Its obvious advantage is its cheapness. Many forms of protective coating exist; galvanizing, cadmium plating, sherardizing, stove enamelling, paint. All these have a limited usefulness as they are liable to damage or, like painting, last only for a few years. Galvanizing is still the most permanent and satisfactory of these coatings. Unfortunately, the only really certain protection, vitreous (or porcelain) enamel, can only be applied to sheet steel. This process is the fusion of glass granules to steel in a furnace at about 1,500°F. The resulting material is extremely durable, colourful and once safely in place (the danger of chipping through careless handling must be taken into account) highly weather resistant. It has long been used for signs and a great many of these belonging to



2, the extruded neoprene gasket which joins the vitreous enamelled panel to the double glazing unit on the General Motors Technical Centre. The gasket, 2 1/2 in. by 1 1/2 in., is tightened by inserting a neoprene filler strip.



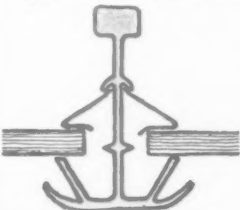
3, two tubular extruded vinyl gaskets weathering the junction between panel and framing. At the corners tubes are cut and fused to make a continuous seal. Weep holes at the foot of the panel are intended to drain any condensation which may form from within the cavity.



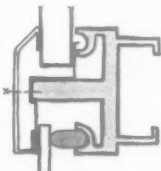
4, a hollow vinyl seal is gripped in a groove extruded as part of an aluminium window section and provides an almost airtight closure. The glass is, incidentally, held by a spring clip pressing it against a mastic tape, a patent glazing method applied here to metal windows.



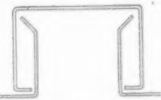
5, two synthetic rubber tapes reinforced with fabric are held under pressure on either side of the sheet metal screw. Such tape provides a very effective and easily applied seal.



6, the spring action of bent metal is fully exploited in this method of patent glazing where it provides both seal and fixing for the glass.



7, a system of curtain walling derived from the patent glazing technique, and again using the spring action of bent metal to hold the glass panel in position.



8, the familiar snap closure in which two pieces of bent metal press against each other. This device is often used in curtain walling when a cover fillet has to be applied.

London Transport, for example, have suffered the severe strain of London grime without ill effect. Vitreous enamel must be clearly distinguished from stove enamelling which is merely the hardening of a special paint by passing the material through an oven.

Vitreous enamelled panels have been used with great success on a large number of buildings. They can be had in any colour except a metallic tint and can range from high gloss to semi-matt. They can also be textured by being corrugated or embossed before enamelling, and in many ways this is to be recommended as such depth will add strength to the sheet and it may be possible to specify a thinner gauge.

A somewhat analogous refractory process fuses small granules of stone to a steel sheet. The resulting panel has a dead matt appearance with a texture not unlike that of coarse sandpaper. Such matt appearance has, of course, the great advantage that any waviness in the metal is completely masked. There is also a great range of colours and the sheet can be either uniform in colour or have a number of colours sprinkled on at random or in a definite pattern. There is, however, a tendency for rainwater to lodge in the small pockets between the granules and for the panel to dry out unevenly if it is protected by a ledge somewhat in the manner of natural stone. Perhaps this material should always be mounted so that it receives completely uniform exposure. This particular refractory process has for some time been used as a lining for the exhausts of Rolls-Royce and Bentley cars and is just beginning to find its way into building.

The limited number of possible shapes in bar steel is due to the fact steel cannot as yet be extruded and is normally hot rolled. Hollow shapes are impossible as are also the rather intricate forms of extruded aluminium or bronze which are so useful in achieving weathertightness.

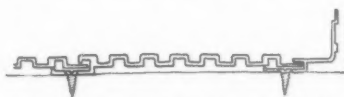
- (b) **stainless steel** Many different alloys are produced but the most useful from the point of view of building, are two groups, one which contains chromium and the other chromium and nickel. The chromium alloys are slightly less corrosion resistant than those which also include nickel, but are lower in cost.

Stainless steel being in any case a much more costly material than either vitreous enamelled steel or aluminium, particular attention should be paid in the design to achieving its most economic use. This usually means texturing the metal in some way to increase its stiffness. Not all attempts at such shaping need have as unfortunate an effect as the 39 floors of the Socony Mobil Building in New York by Harrison and Abramovitz. It is

often quite useful to restrict stainless steel to critical areas where some sparkle is needed. Farmer and Dark have done this on their factory for Bowaters, for example, where the cover plates to the steel grid are in stainless.

Although stainless steel is a perfectly satisfactory finish by itself and variety can be obtained by different degrees of reflectiveness and by the brushing of the metal, it can also be coloured by being glazed in the manner of vitreous enamel. This is still an experimental process but its possibilities are very interesting. A translucent glaze can be used which allows some of the sheen of the metal to come through and it can also be applied merely to the low areas of patterned sheets so that the high points remain bright and metallic. Great potentials of rich colour and texture remain to be developed.

- (c) **aluminium** Aluminium alloys have been used a great deal on curtain walling largely due to the fact that a great variety of shapes and forms of aluminium are available and that, properly coated, it will not deteriorate. Aluminium is available in sheet form, castings and extrusions. Its great virtue is undoubtedly the great range of profiles which can be extruded. Such profiles can be designed to include weathering bars, interlocking joints, pockets for mastic, stiffeners and so on. Extrusions have for long been used on aluminium windows (too often, unfortunately, imitating steel sections), and they are now common for curtain wall framing but flat interlocking extrusions, it should be remembered, can also form panels or column covers. One such shape which is in the standard range of



10, one of a range of interlocking extruded aluminium sections which can be used for cladding purposes.

an Italian aluminium company is shown in 10.

It is most important that aluminium should be adequately protected by being anodized. This is an electrolytic process which increases the thickness and effectiveness of aluminium's natural hard oxide coating. Without such protection it is really not a suitable material for urban use. Anodizing adds about 15 per cent to the cost. This is a rather high percentage which is still charged in this country owing to the very limited facilities for anodizing which are available. Specification for aluminium curtain walls should, however, always include for this additional price.

Special aluminium alloys may now also be had with coloured finishes. These are at the moment restricted

to a very small range which includes blue, gold, green-yellow and black. It is still questionable whether these colours, with the possible exception of black, which has been used on Olivetti's recent office building in Milan, are really permanent. A dark grey colour, rather like gunmetal, can also be produced by anodizing an alloy with a high silicone content.

Aluminium sheets can also be vitreous enamelled using a low temperature process which fuses the glass frit at about 1,000°F. Unlike enamelled sheet steel, aluminium panels can be cut, drilled and pressed to some extent after enamelling and their edges are not vulnerable in the same way since even if the enamel should be chipped off, the metal will not rust.

Aluminium is a soft and vulnerable material and should be installed with great care and protected during erection. A temporary protective lacquer such as methacrylate should always be specified over the entire work to avoid staining the metal through contact with alkaline mortar and plaster. Metals (other than stainless steel, zinc and white bronze), concrete, masonry and timber which is liable to become wet or which has been treated with a preservative should all be painted where in contact with aluminium to prevent an electrolytic action.

- (d) **bronze** Like aluminium this can be extruded though not in hollow sections; its weathering properties are, however, very different since bronze mellows to a dark brown with a slight green patina naturally and then retains that colour. It also has a hard precision which is sometimes difficult to achieve in aluminium. It was for these reasons used by Mies van der Rohe and Phillip Johnson for both framing and panels on their office building for Seagrams. Bronze has not been tried in this country on curtain walling since the war, presumably because of its high cost.

## 2. wood

This is in many ways a very good material for curtain walls especially if one of the timbers not needing painting, such as teak or Western Red cedar is used. Timber is, of course, particularly good from the point of heat insulation. Fire laws in built-up areas, however, are unfortunately likely to restrict timber curtain walls to schools and similar buildings.

The design of the wall must take into account the movement which is natural in timber and provide for joints which cope with this. Sections of the material will be a great deal bulkier than those in metal with a consequent emphasis on the vertical and horizontal grid. Window openings, if also in timber, will give yet more thickness and become dominant in the pattern. Their disposition on elevation can in no way be ignored. Windows can, of course, be in metal. The use of a hori-

continued on page 185

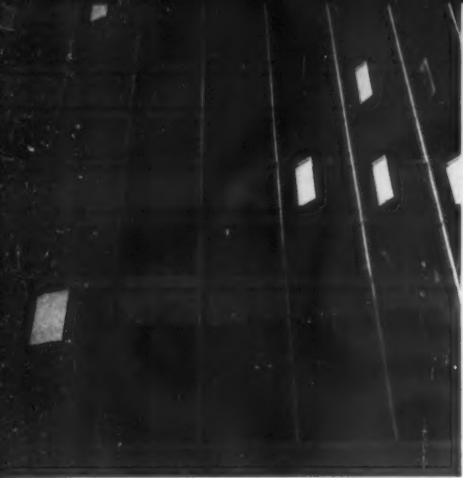
**NOTE** a review of the standard infilling panels now on the market in Great Britain is given in the *SKILL* section of this issue, starting on page 212.

*steel* Curtain wall systems using steel derive either from the early factory walls or the pressed metal technique of shop fronts. Those based on industrial walling often use the so-called Detroit bar mullion to which standard window sections and transom bars are coupled up in the same way in which a large window could be constructed. As a very rough guide such a wall without glass or infilling panels might cost a little less than 10s. a square foot erected.

John Thompson Beacon, Crittall, Henry Hope, Mellowes, Morris Singer, Williams & Williams and Wragge are some of the manufacturers who market curtain walls in steel.

1. This curtain wall some time ago took the place of Frascati's ebullience and now mirrors and distorts the silhouette of the south side of Oxford Street. The wall is composed of pressed metal mullions and flat transomes with 'Vitrolab' panels and was made by The Morris Singer Company. Architects: Fitzroy, Robinson and Hubert H. Bull.





2

2. The mullions on Penberthy's building in Oxford Street are in pressed steel but differ in profile and effect from those in 1. The grid was made to the design of the architects by the Crittall Manufacturing Co.

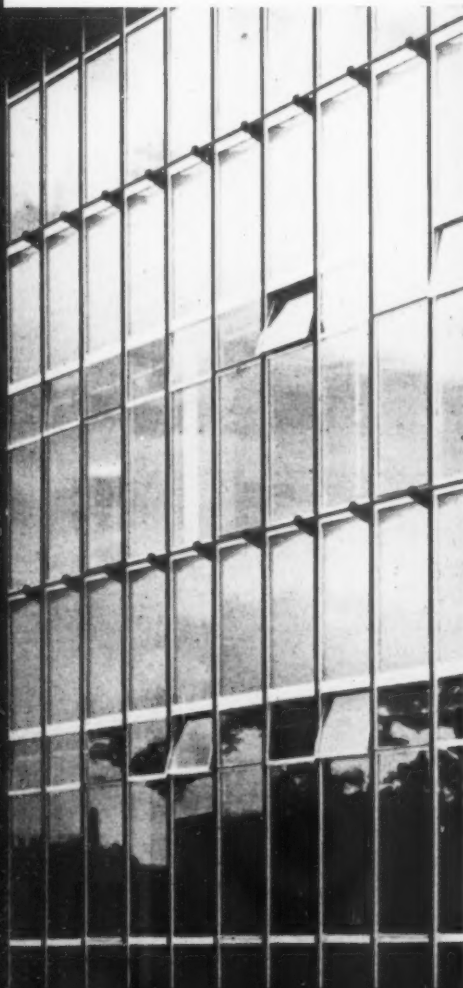
Architects: C. Edmund Wilford & Son.  
3. The small rail used as a support for ladders and the repetitive punctuation of its brackets provide the sort of functional enlivenment which curtain walls often lack. George Wragge were responsible for this cladding at Oldwood Secondary School, Wythenshawe.

Architect: L. C. Howitt, Manchester City Architect.

The visual importance of the relation of cladding to structure can be seen at Samuel Pepys Secondary Modern School, Deptford, 4; in the large block the wall is either in front or behind the columns, in the low block between them. The feeling of depth need not be incompatible with the use of curtain walling. This wall of standard rolled sections is by Henry Hope & Sons.

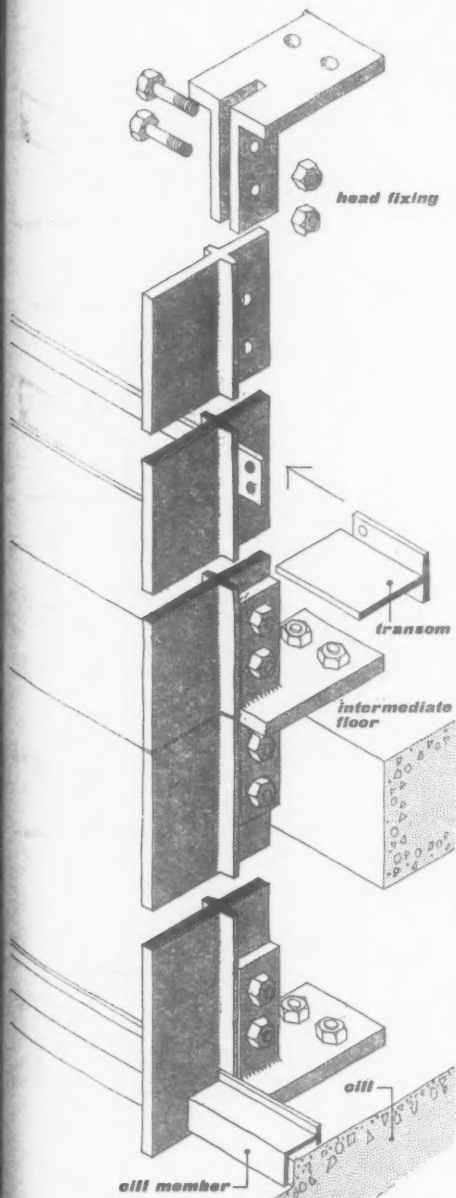
Architects: Gollins, Melvin, Ward & Partners.

3

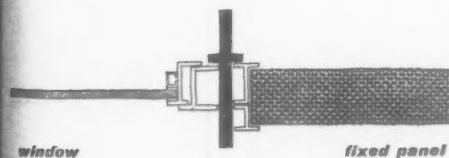








ISOMETRIC DIAGRAM OF SYSTEM

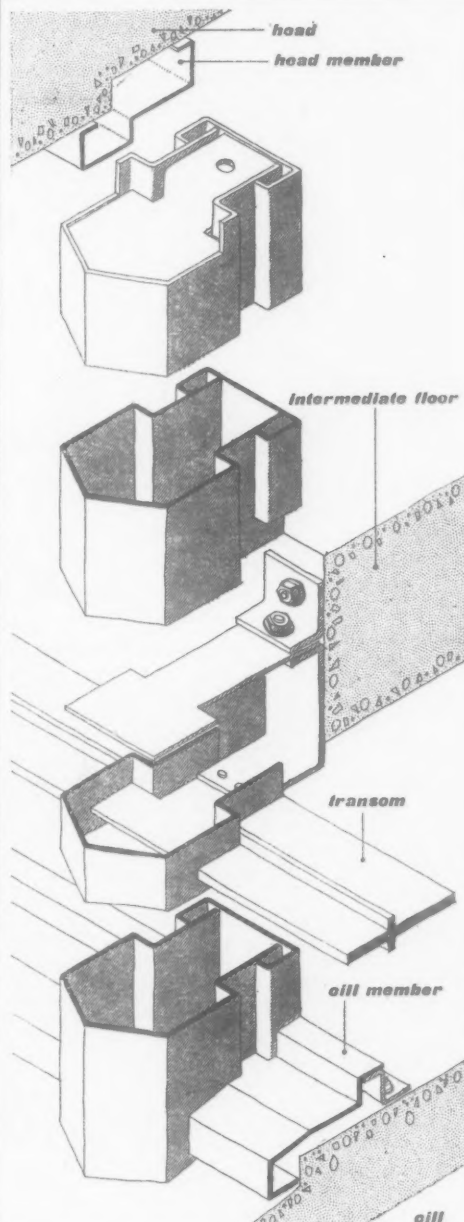


PLAN OF MULLION

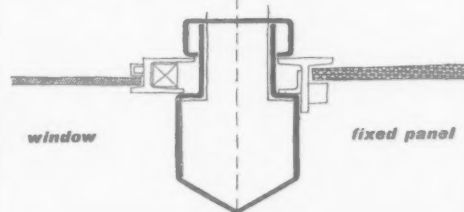
# JOHN THOMPSON BEACON WINDOWS

**Material Steel** **Cost Index: 90\***  
**Note** The Detroit mullion used in this system has for long been employed on large expanses of factory glazing and this design really varies little from that practice except that it allows (without any great subtlety) for the use of solid infilling panels.

\*The figure 100 has been assigned to the mean in the range of prices for grid and windows erected. No account is taken of infilling panels or glazing. This comparison is merely a rough guide and in no way a substitute for competitive quotations.



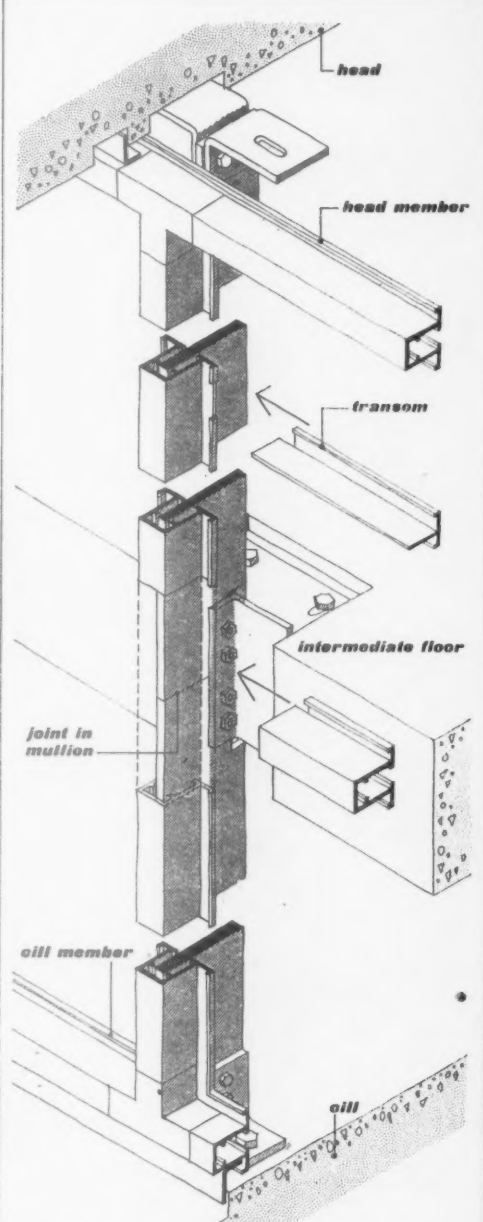
ISOMETRIC DIAGRAM OF SYSTEM



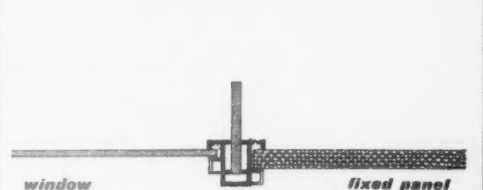
PLAN OF MULLION

# MORRIS SINGER 'HOLOFORM'

**Material Steel** **Cost Index: 90**  
**Note** The main members of this system are pressed out of sheets which have been previously galvanized by the patented process which allows for fabrication after treatment. The simplicity of such fabrication makes it possible to vary the mullion's profile, for example, without a considerable tooling charge. The manufacturer also produces a number of other designs in steel including a system based on the Detroit mullion which has the main members of the grid capped by stainless steel covers.



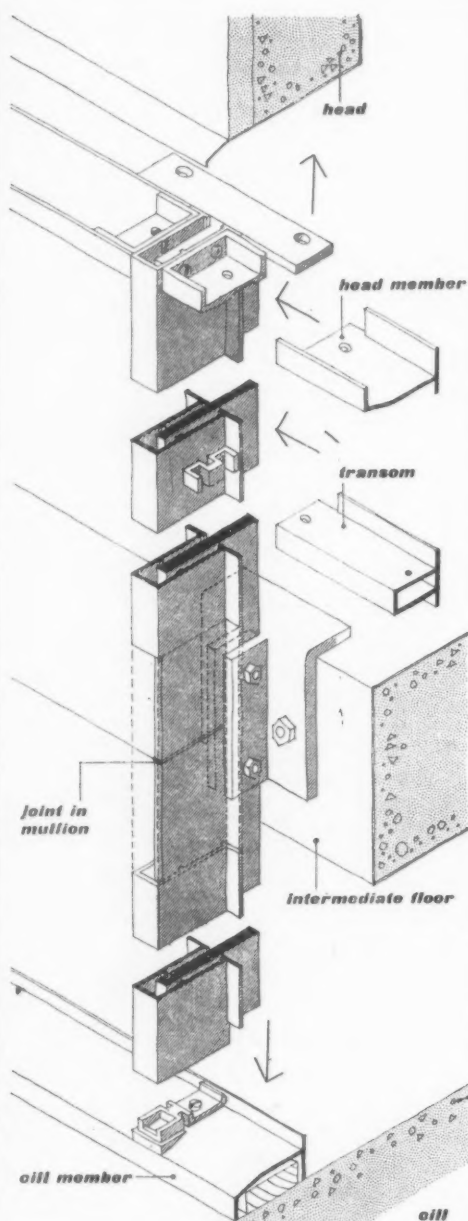
ISOMETRIC DIAGRAM OF SYSTEM



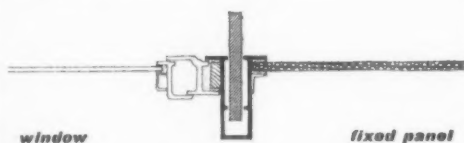
PLAN OF MULLION.

# HENRY HOPE 'WINDOGRID'

**Material Aluminium and steel** **Cost Index: 115**  
**Note** A flat steel bar is used in this system to give rigidity to the vertical members. The bar is galvanized so that no problem should arise from its contact with aluminium. All fixings to the structure are made from this bar; the question of obscuring the head and sill fixings in the room does not however seem to have been dealt with.



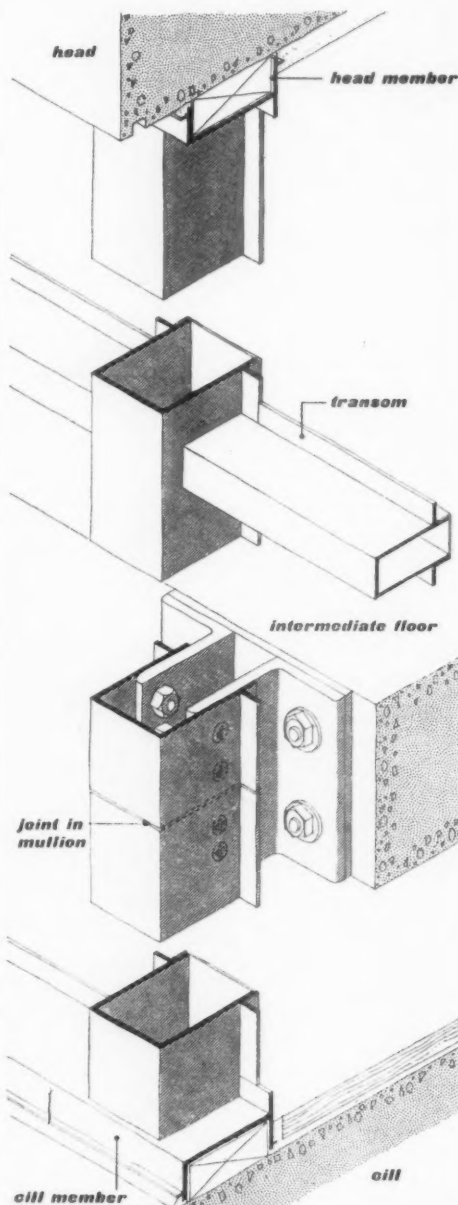
ISOMETRIC DIAGRAM OF SYSTEM



PLAN OF MULLION

JOHN WILLIAMS (CARDIFF)

**Material** Aluminium and steel **Cost Index:** 100  
**Note** As in the case of Hope's 'Windowgrid,' a galvanized steel flat is the vertical structural member of this system. All aluminium members are, however, very much deeper than in Hope's design and the visual effect will be more like that of the box mullion systems.



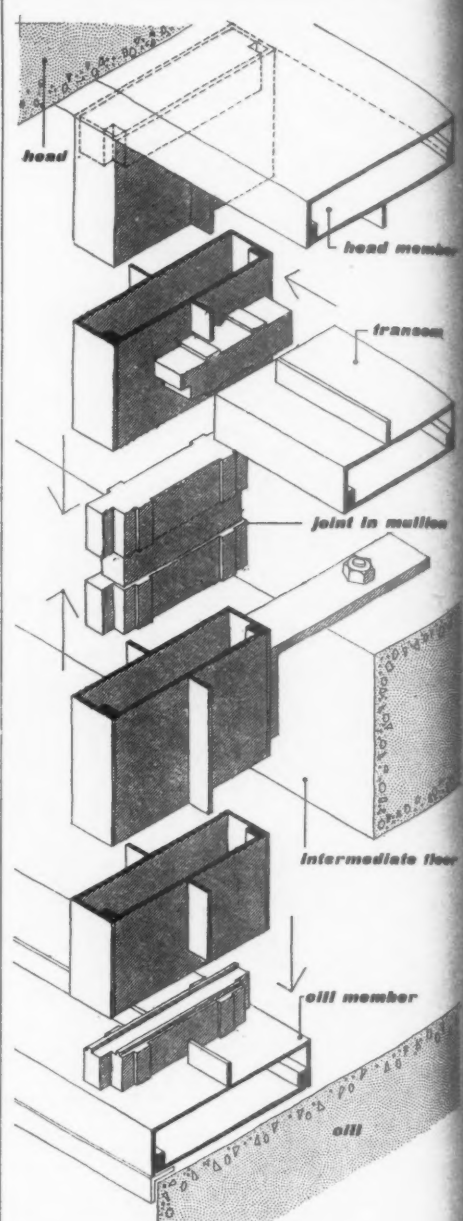
ISOMETRIC DIAGRAM OF SYSTEM



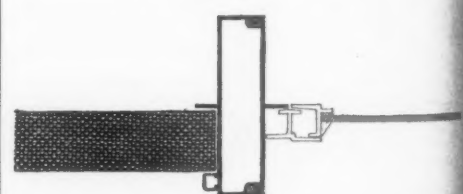
PLAN OF MULLION

AYGEE

**Material** Aluminium **Cost Index:** 125  
**Note** This rather unsophisticated grid uses an open channel shaped section for mullions and transoms thus avoiding the cost of a hollow extrusion. The open mullion also makes it possible to take a partition right into the curtain wall; no similar advantage seems to be gained in the case of the transom. To reduce cold radiation from the wide mullion it may be advisable to line the cover strip with an insulating material.



ISOMETRIC DIAGRAM OF SYSTEM



fixed panel

PLAN OF MULLION

JAMES GIBBONS 'WINDOWALL'

**Material** Aluminium **Cost Index:** 114  
**Note** This is one of the few systems which employs the split section principle for both mullions and transoms which would make it possible to preassemble large cladding units, were it not that in this particular version, the horizontal members are continuous. Thermal movement and erection tolerances can be absorbed in the overlap of the two sections. Windows and panels can also be fixed on the inside of the flange thus giving a greater depth to the mullion as seen from the outside.

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## *steel and aluminium*

The earliest English curtain wall, Hills'

patent glazing system, belonged to this group and pioneered the idea of using a structural system made of rolled steel sections, protected by a cover made from a rust-proof metal like aluminium or stainless steel. Since then, this technique has also been applied to the form of curtain walling shown in the previous section and in some instances developed to the extent that steel is merely used in an aluminium grid as a reinforcement to the mullion. Some examples, therefore, when seen from the outside, are indistinguishable from an aluminium curtain wall. At least five firms, Hills, Henry Hope, Morris Singer, John Williams and George Wragge, make walls of this kind and the cost varies greatly depending on the proportion of steel to aluminium.

5, New Cavendish Street, W.1. has the unusual spectacle of two curtain wall buildings by the same architects facing each other; this is the second of the two and is perhaps the first attempt in this country to achieve a horizontal feeling in a curtain wall. The black grid made by Mellows & Co. is composed of steel sections covered with a 3-in. aluminium channel, and the panels are white glass. Architects: Gollins, Melvin, Ward & Partners.





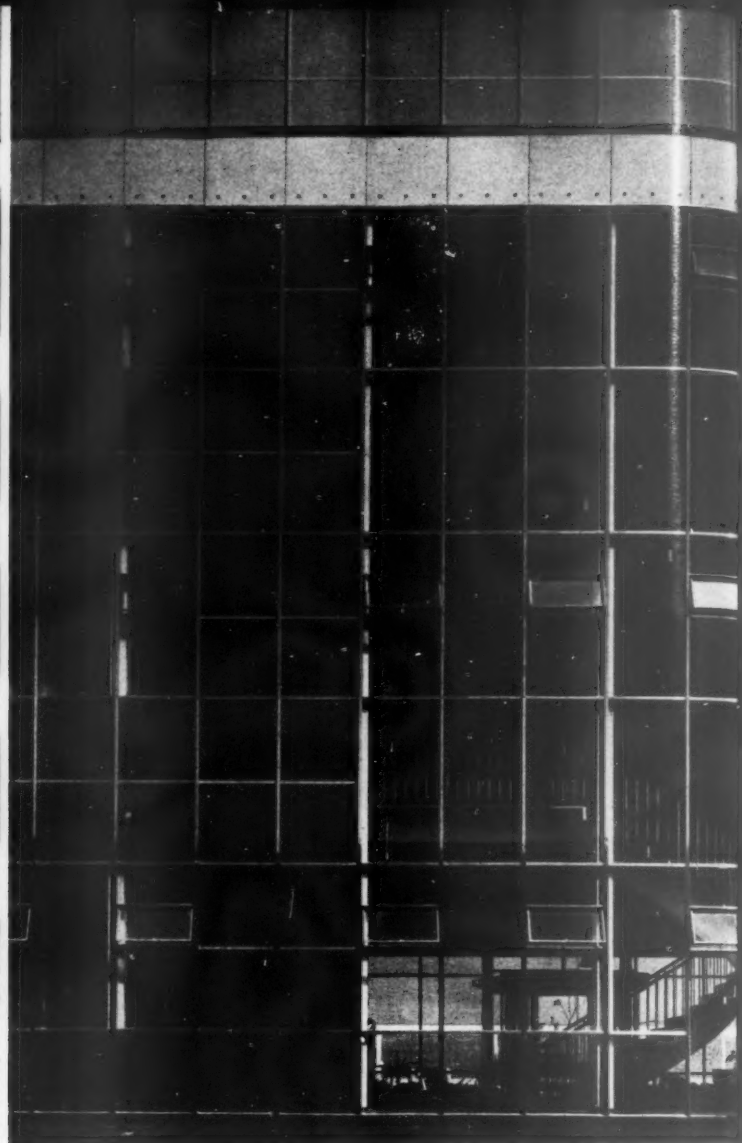
6

6. Strand Comprehensive School, Putney, which uses Hills' early system with its galvanized steel bars covered with an aluminium cover. The staircase bay is an interesting attempt to solve the problem of the half landing on a transparent façade by folding the curtain wall.

Architect: Architect to the London County Council.

8

7. Stainless steel is used here to cover the steel members to provide



7

both protection and sparkle. This elevation is part of the considerable complex of buildings using various forms of curtain walling at the Bowater Paper Corporation's new plant at Northfleet.

Architects: Farmer & Dark.

8. The dissolution of the glass façade at night in this view of the Heinz office in Cardiff clearly emphasizes the sparseness of the curtain walling grid; in this case a series of aluminium extrusions reinforced by a steel bar made by John Williams.

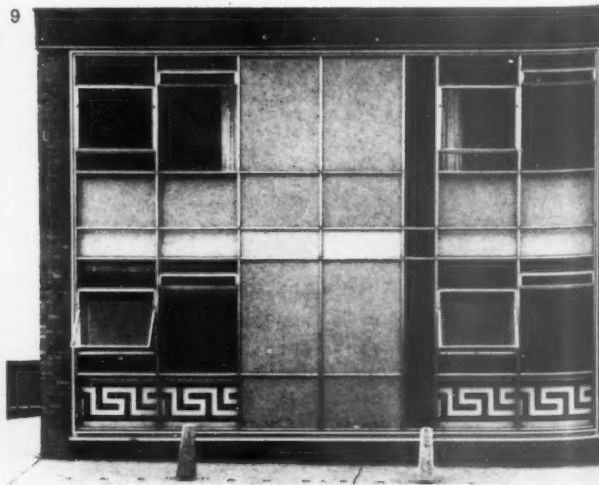
Architects: Grenfell Baines & Hargreaves.

9. Coloured panels behind glass have for some time been a normal way of achieving colour on the façade; the use of patterning is relatively new and obviously holds out both possibilities and pitfalls. The small office building at Ponders End uses Henry Hope's 'Windowgrid'.

Architect: Kenneth Boyd.



9

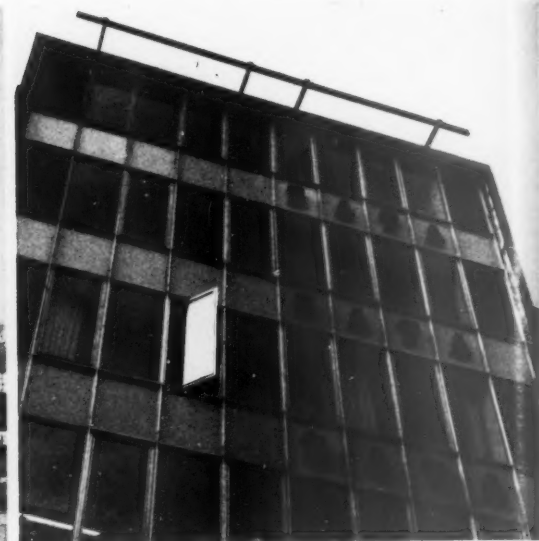
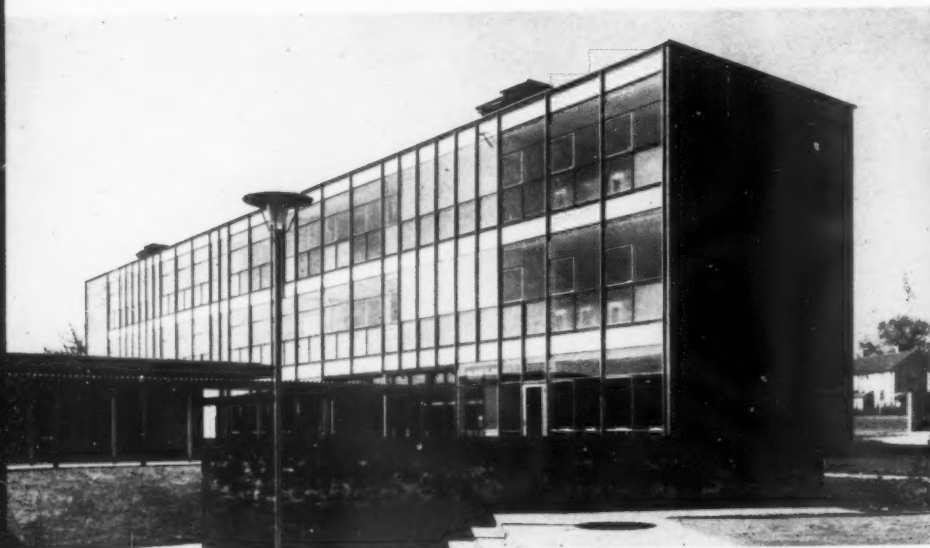


*aluminium* The curtain wall built up from aluminium extrusions is, despite its higher cost, probably the most common form in use today. In terms of maintenance, aluminium or stainless steel seem to be the logical materials for a metal curtain wall structure. Many manufacturers have, therefore, developed aluminium designs; these include Aygee, Fred. Braby, Crittall, James Gibbons, Hawksley S.M.D., Hills, Holoplast, Mellowes, Quicktho, Standard Patent Glazing, Williams & Williams and W.B. Casement. Although, with the exception of Holoplast, these designs start from much the same assumptions, they differ greatly in technical detail but relatively little in appearance. Holoplast has also no marked visual characteristics but is designed so that a cladding unit consisting of grid, window and

[continued on page 181]

10. provided the radius is not too small, curtain walling can be wrapped around a curved building without posing too many problems. Tower House, in Hopton Street, S.E.1, using 'Wallspan,' is one of the number of London buildings which have attempted the curved curtain wall with varying degrees of success.  
Architects: Alleyn & Mansel.





11

11. Cole Green Lane Secondary Modern School at Welwyn Garden City uses the heavier of the two curtain walling systems produced by Quicktho.

Architect: C. H. Aslin.

12. Bata's shoe shop in Oxford Street uses Williams and Williams' 'Wallspan' with coloured 'Vitrolab' panels and boldly projects the necessary gantry rail.

Architects: Katz & Vaughan.

13. an office building in Fenchurch Street is, like 11 and 12, another

13

example of 'Wallspan' yet very different in effect. The curtain wall, as can be seen, greatly emphasizes the architectural importance of proportion.

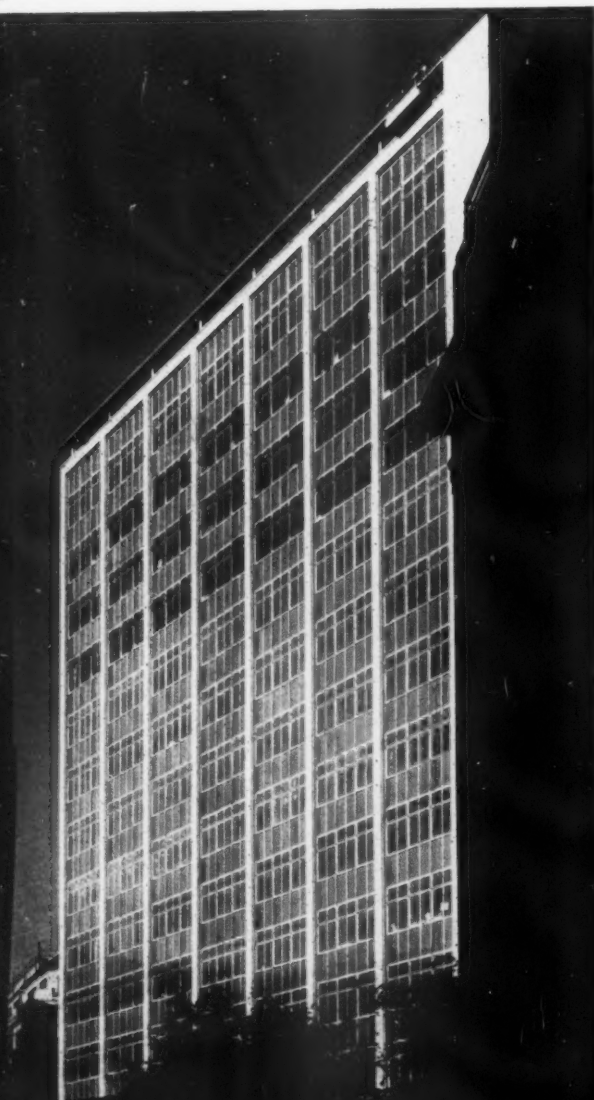
Architect: W. H. Rogers; consultants, Easton and Robertson.

14. The juxtaposition of curtain wall to masonry or brickwork is a problem which has no easy architectural answers except perhaps its avoidance in the first instance. These offices in the Minories use Hills' new aluminium curtain wall.

Architects: Howard, Souster and Fairbairn.

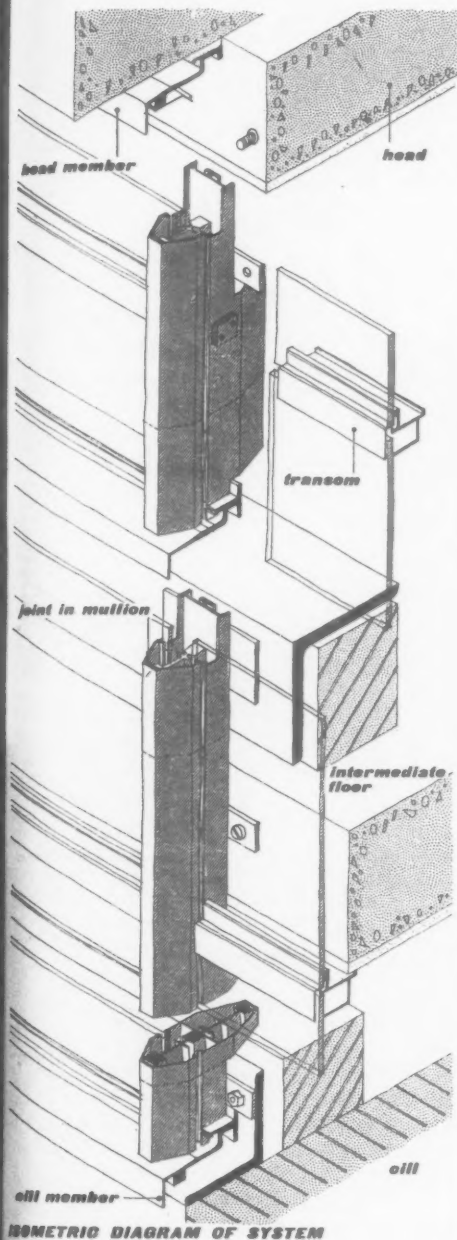
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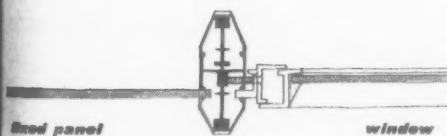








ISOMETRIC DIAGRAM OF SYSTEM



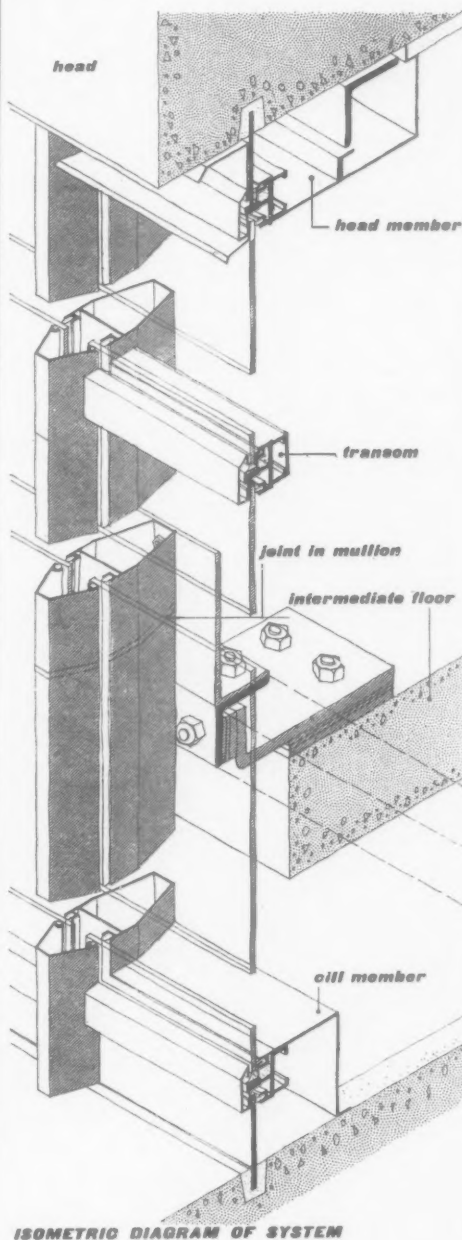
PLAN OF MULLION

### STANDARD PATENT GLAZING

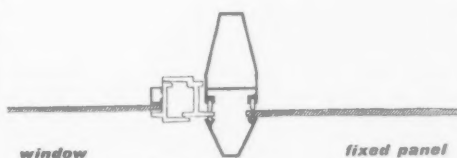
Material Aluminium

Cost Index: 125

**Note** The principle of patent glazing is here, as in the case of Hills, applied to curtain walling. Unlike Hills, however, the outer section is not used structurally so that there seems to be rather more material in the mullion than would seem necessary. A weakness of both these systems is that there is a strict limitation on the thickness of the panel or its flange which can be conveniently housed.



ISOMETRIC DIAGRAM OF SYSTEM



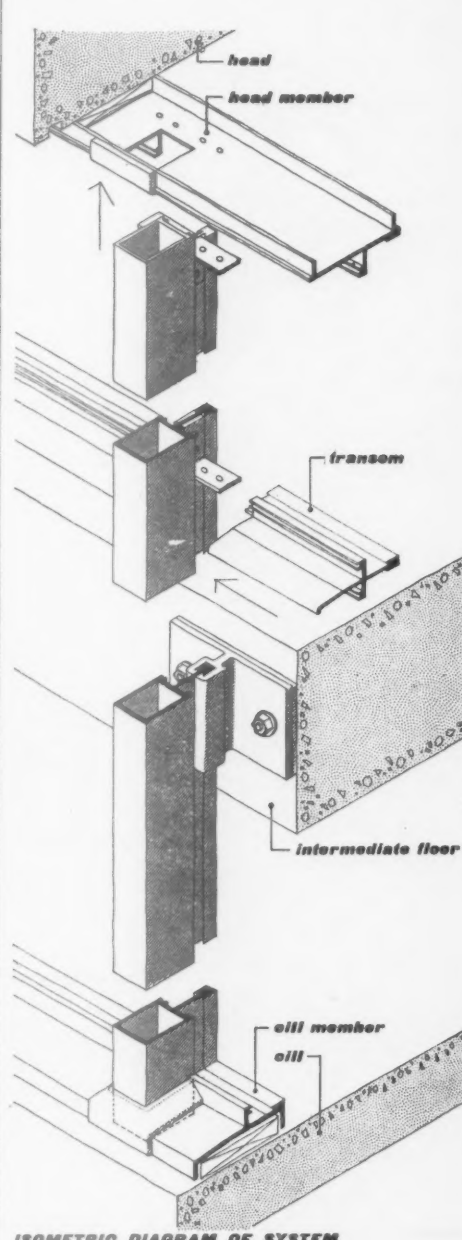
PLAN OF MULLION

### HILLS (WEST BROMWICH)

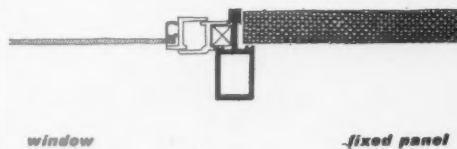
Material Aluminium

Cost Index: 80

**Note** Some of the earliest English curtain walls used a much less refined version of this system based on patent glazing. This new and improved method is a very simple and economical curtain wall except for the curious weathering of the transom, where a piece of sheet metal has to act as a flashing behind the cover holding the glass in place. A series of accessories like ceiling and sill closures is also available and goes some way towards providing a complete cladding installation.



ISOMETRIC DIAGRAM OF SYSTEM



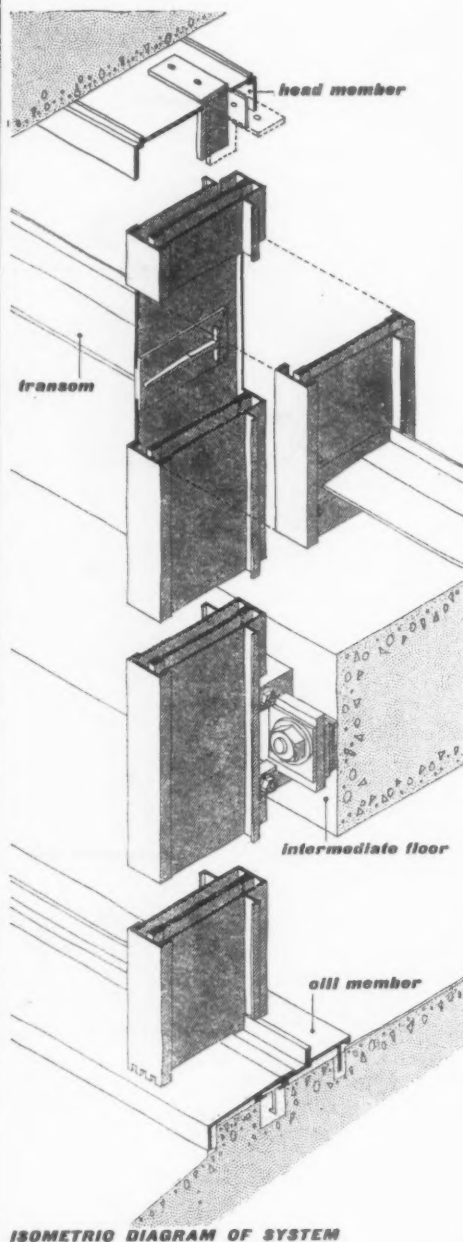
PLAN OF MULLION

### W.B. 'VISTALITE'

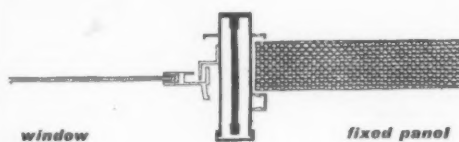
Material Aluminium

Cost Index: 100

**Note** The combination of a relatively wide hollow mullion with a thin transom shaped rather like a steel weathering bar will create considerable vertical emphasis in the grid. The relation of panels to the mullion has not been too fully considered and the necessity for timber to fasten the window seems questionable, particularly when one remembers that aluminium should be protected when in contact with wood treated with a preservative.



ISOMETRIC DIAGRAM OF SYSTEM



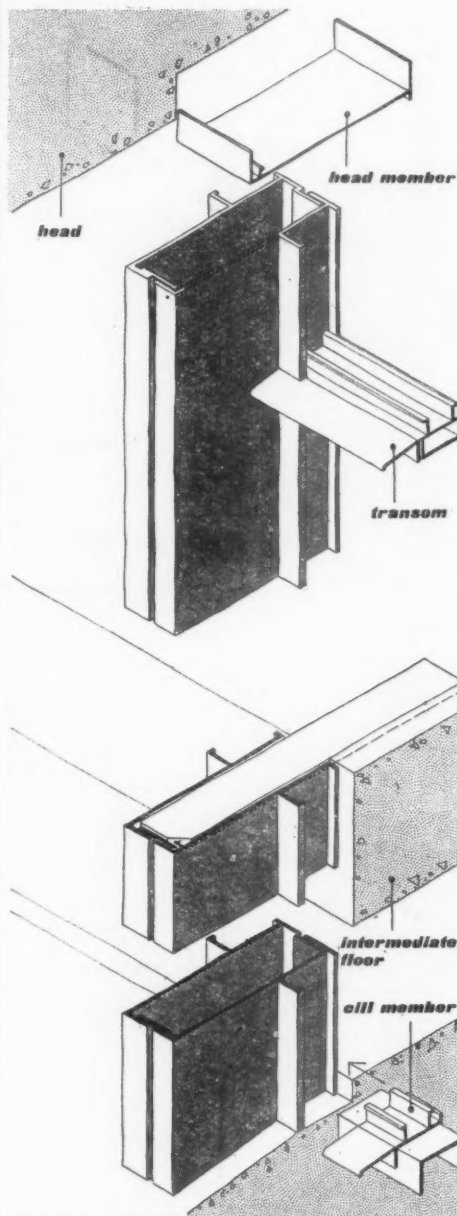
PLAN OF MULLION

## QUICKTHO 'WINDOWALL'

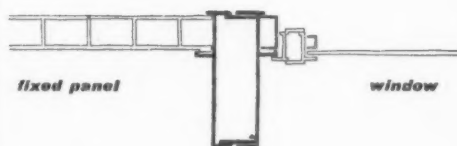
Material Aluminium

Cost Index: 125

**Note** With great ingenuity the hollow mullions of this system are used as drain pipes for any moisture which may penetrate the joints. To achieve this, head and transom are taken through the outer webs of the mullion. A variant of this design includes condensation gutters in the transom and sill which also drain into the hollow mullion and which would be useful where large un-insulated areas occur. A wall composed of lighter sections is also available.



ISOMETRIC DIAGRAM OF SYSTEM



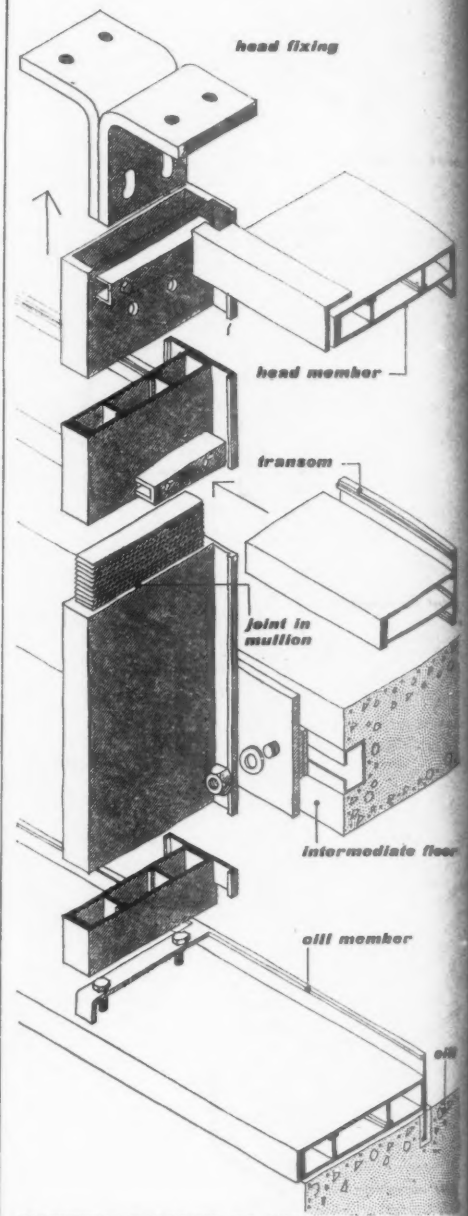
PLAN OF MULLION

## HOLOPLAST

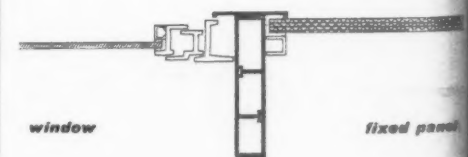
Material Aluminium

Cost Index: 100

**Note** This is the only English curtain walling which may be erected from assemblies rather than components, making a much greater degree of shop fabrication possible. The split mullions are fixed rigidly at one point only so they may expand and contract freely. As the curtain wall is produced by manufacturers of hollow phenolic panels, it is intended that these should be incorporated. This may be a drawback, as the colour and textural effects available in this panel are limited.



ISOMETRIC DIAGRAM OF SYSTEM



PLAN OF MULLION

## MELLOWES 'MELLOWCLAD'

Material Aluminium

Cost Index: 116

**Note** This is one of the three designs available which use a split mullion except that in this case, as in the case of James Gibbons, certain features make it impossible to exploit one of the main virtues, namely the fabrication of assemblies. Surprisingly the mullion is designed so that no sliding action can take place to absorb both erection tolerances and thermal movement.



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*aluminium (cont.)* 15. school at Bannockburn employing the Holoplast system of aluminium grid and phenolic infill panels.

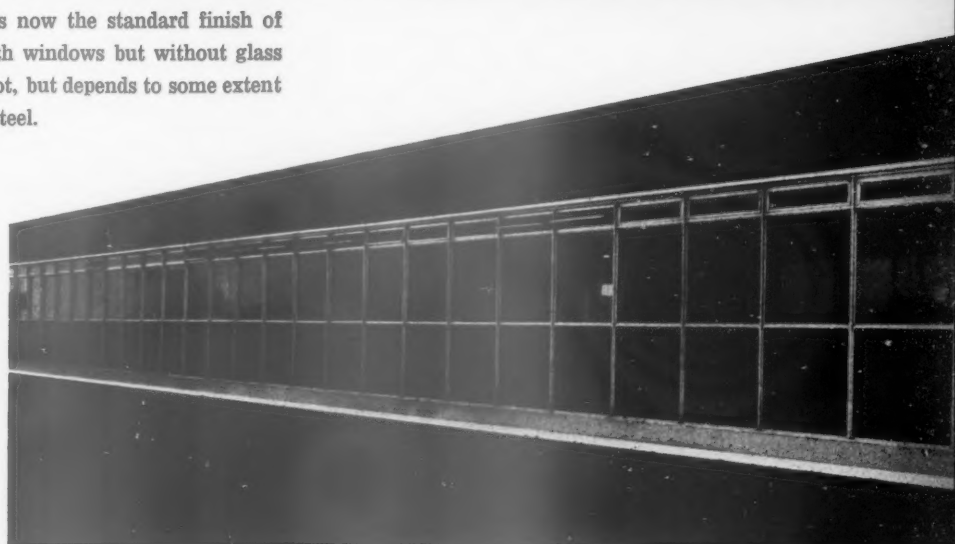
Architects: Alison & Hutchison.  
16. the sixteen-storey block of flats at Golden Lane is probably the tallest curtain wall structure so far built in this country. It uses Quicktho's 'Integral' system composed of quite thin extrusions fastened to timber members.  
Architects: Chamberlin, Powell & Bon.



15

panel can be shop assembled and then fixed as a completed assembly. Most aluminium curtain walls can be supplied with an anodized finish which adds to the cost but is highly desirable in urban atmospheres; an acid etched finish, which in terms of weathering is also an improvement on the ordinary mill finish, is much less costly and is now the standard finish of 'Wallspan.' The cost of an aluminium grid with windows but without glass or infilling panels may be about 15s. a square foot, but depends to some extent on whether the windows are in aluminium or steel.

16



17

17 and 18, two curtain walls by the same architect for the Ford Motor Company. 17 is at Basildon and is a natural aluminium grid by Hawksley S.M.D. with the deep ribbed fascia and panels in black anodized aluminium. 18 is at Aveley and is 'Wallspan' with blue 'Vitrolab' panels.  
Architects: E. R. Collister & Associates.

18



# timber

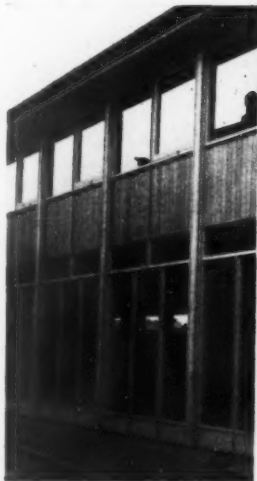
Only two curtain wall designs in timber are being marketed at the moment—Newsoms' 'Wallpak' and Janes's 'Modolite'—although ample precedent for prefabricated components would seem to exist in structural systems in timber like Derwent or Medway. Most of the timber curtain walls seen today are specially designed for a particular job and in fact two of the three examples shown belong to this latter group. The simplicity of working timber makes such special designs an economic possibility.

19. Janes's 'Modolite' at St. Andrew's School, Southgate. Architect: D. A. Pettit (assistant to Borough Engineer).

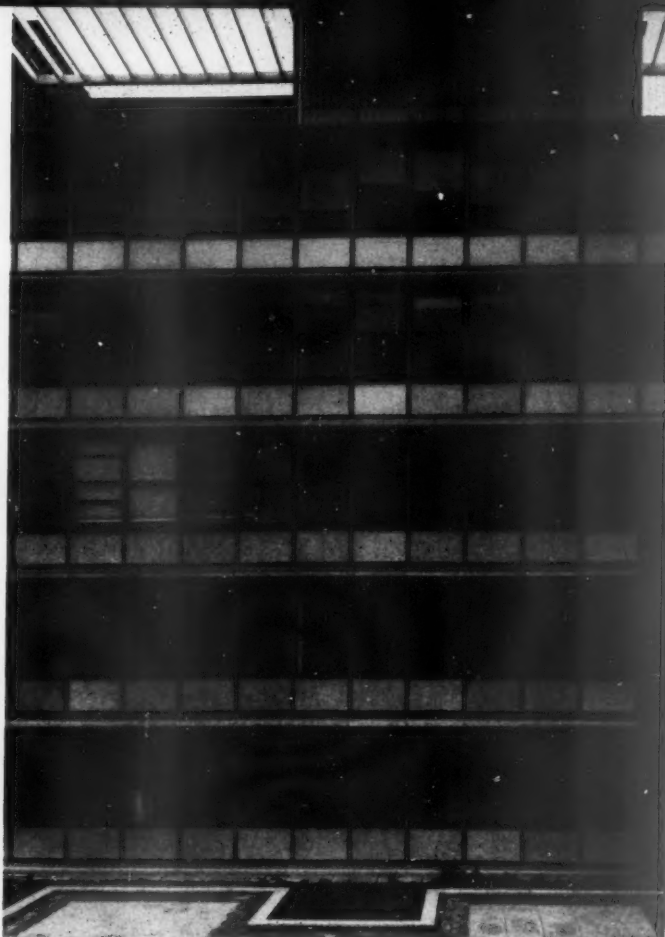
20. the Quintin School, St. John's Wood. Timber curtain walls tend to look bulky but the elegant white line down the centre of the mullion like the gap in the example below does a great deal to reduce the apparent thickness. This specially designed wall was made by John Sadd.

Architect: Edward D. Mills.

21. a highly ingenious but specially designed timber system at the new Air Terminal, Cromwell Road. Designed by BEA Architects' Department.



19



20

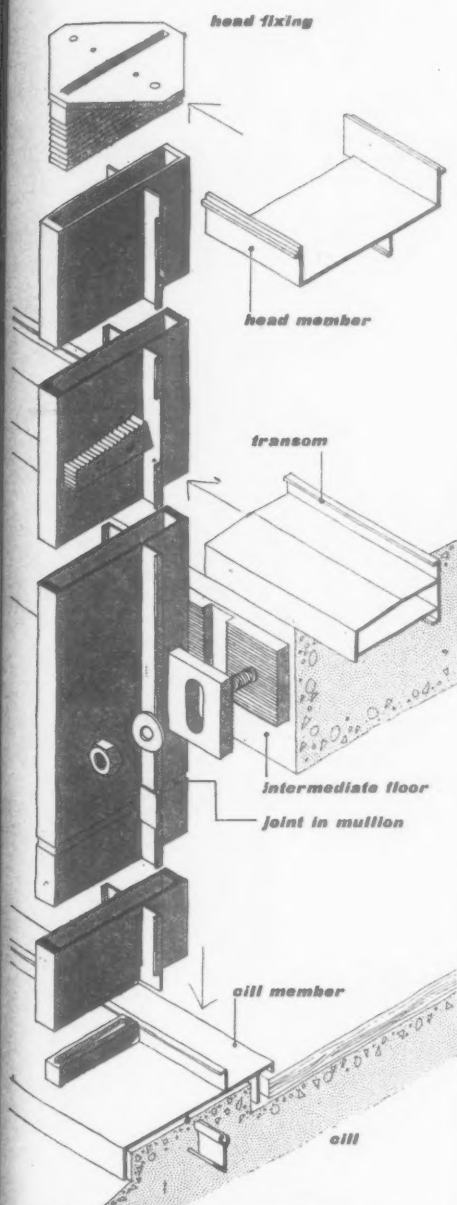


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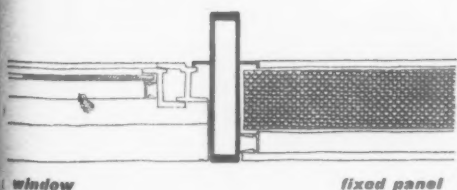
182







ISOMETRIC DIAGRAM OF SYSTEM

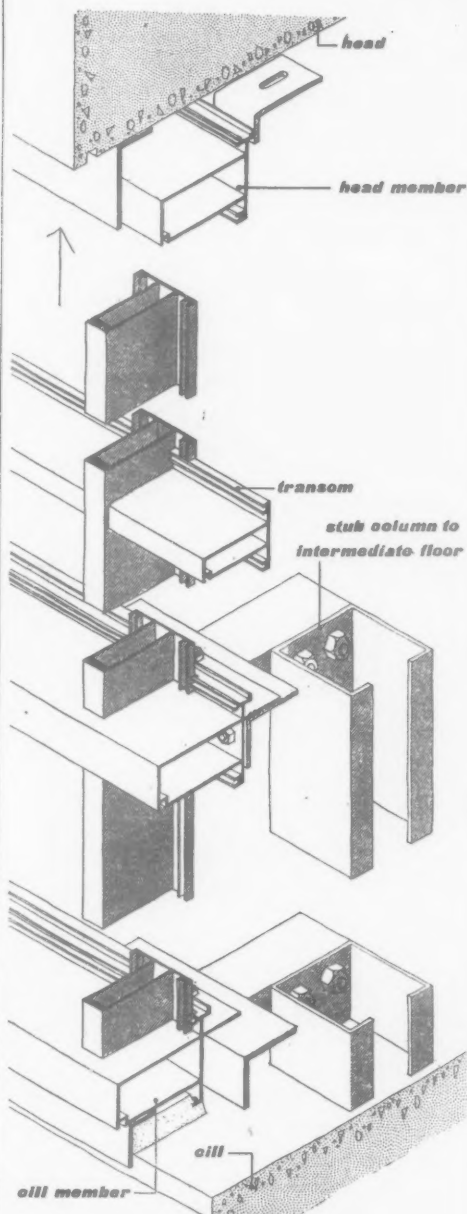


PLAN OF MULLION

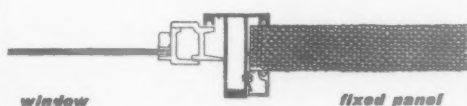
### WILLIAMS & WILLIAMS 'WALLSPAN'

Material Aluminium Cost Index: 100

Note The acid-etched finish now supplied as standard ensures much more even weathering than can be expected from plain mill-finished aluminium. Such consideration for weathering properties is commendable. The grooved spigots allow mastic to have some hold and not be squeezed out when sections are joined to each other. Unlike many other systems, this design acknowledges the existence of finishes in the profile of its head and cill members.



ISOMETRIC DIAGRAM OF SYSTEM

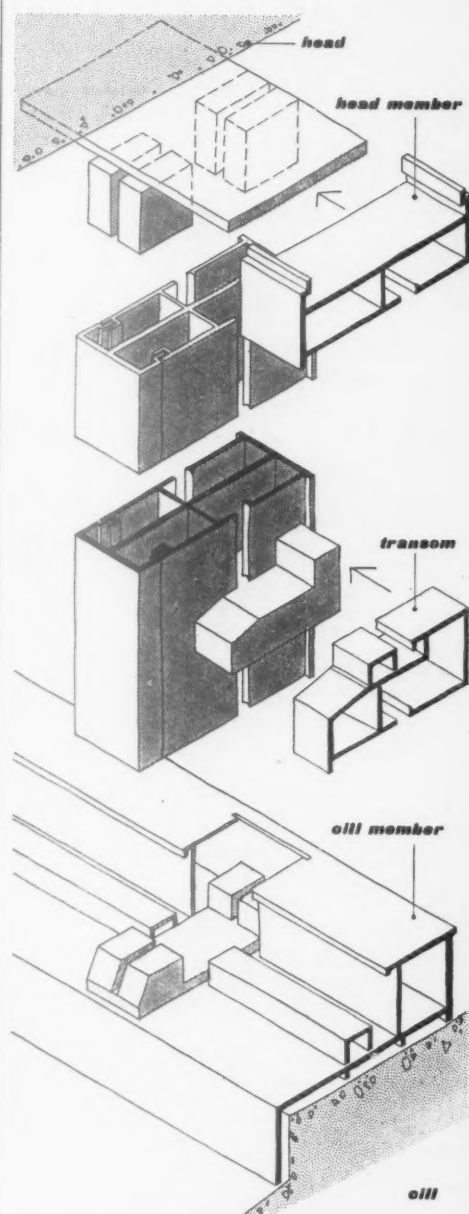


PLAN OF MULLION

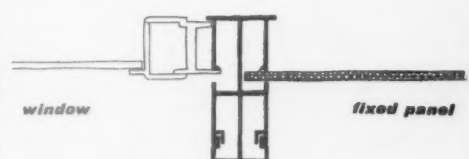
### CRITTALL 'FENESTRA'

Material Aluminium Cost Index: 125

Note An extruded gasket gripped in a groove provides a continuous seal and this is the first English curtain wall to adopt such a design. The stub columns which reduce the clear span of the aluminium mullions are equally new to this country; their relation to a back-up wall could create problems. The head which is clipped on around panels prevents visible screws and the possible damage to aluminium from a slipped screw driver. (Exposed screw heads should thus always be Phillips head.)



ISOMETRIC DIAGRAM OF SYSTEM

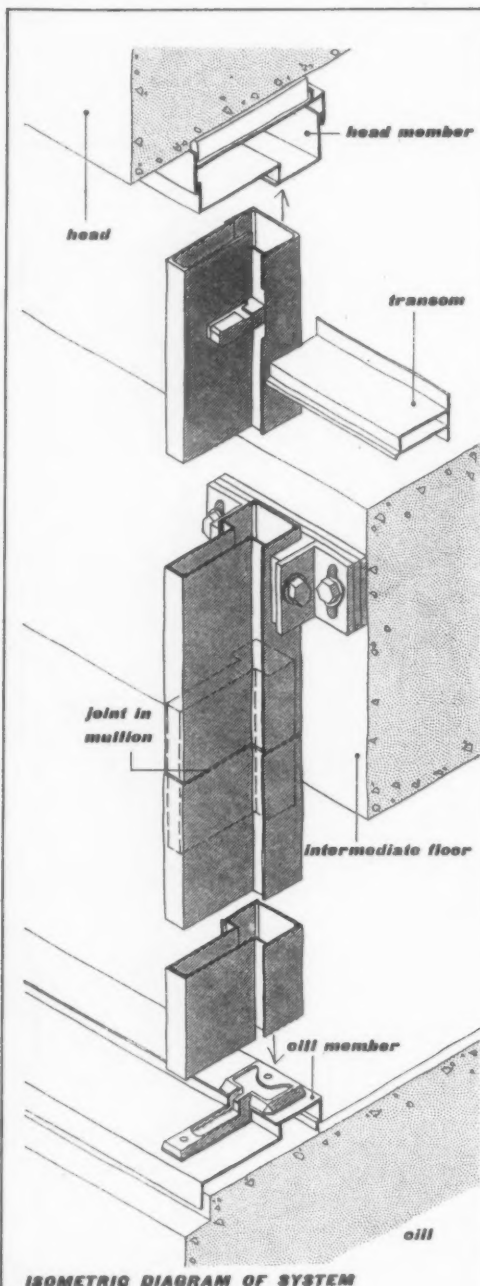


PLAN OF MULLION

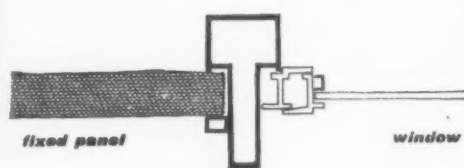
### S. WARNER

Material Aluminium Cost Index: 75

Note This is a revised version of an earlier design produced by this manufacturer. As in the case of 'Quicktho,' the horizontal members are taken into the mullion which can then drain any moisture to the ground. The cruciform mullions are built up from three sections thus saving the cost of hollow extrusions and making some of the fabrication easier. Like most other aluminium curtain walls, this grid can, for an additional cost, be had with an anodized finish.



ISOMETRIC DIAGRAM OF SYSTEM



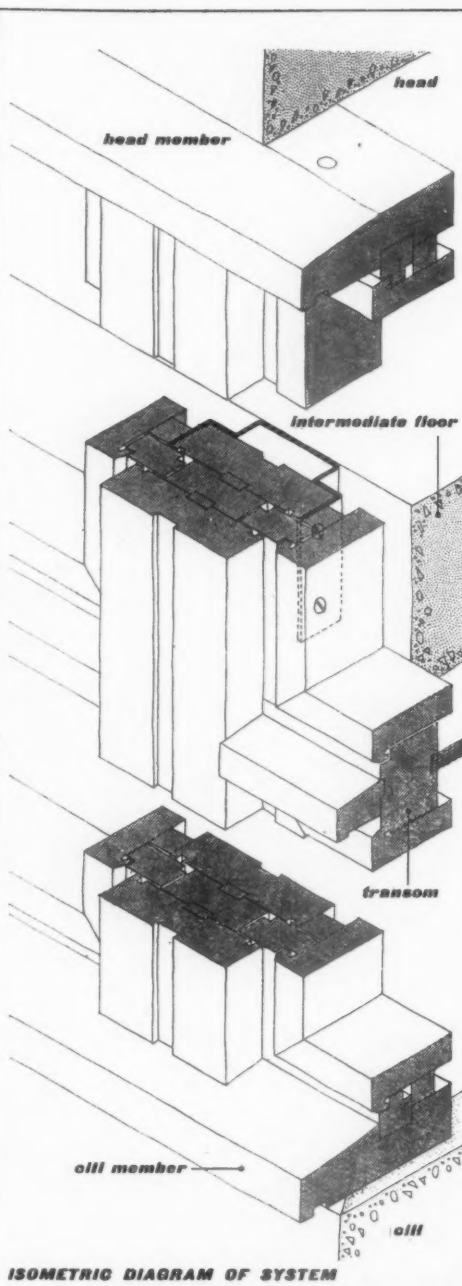
PLAN OF MULLION

HAWKSLEY S.M.D.

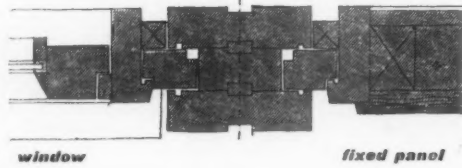
**Material Aluminium**

Cost Index: 120

**Note** The additional width of the mullion on the inside face may prove useful when abutting partitions; the equally sensible rounded corner pieces on the fixing beads and curved drips on the horizontal members may, however, destroy the crispness often demanded from curtain walling. The sleeved expansion extrusion at the head, which would absorb movements in both the curtain wall and the structure, is a section too often omitted by other manufacturers.



ISOMETRIC DIAGRAM OF SYSTEM



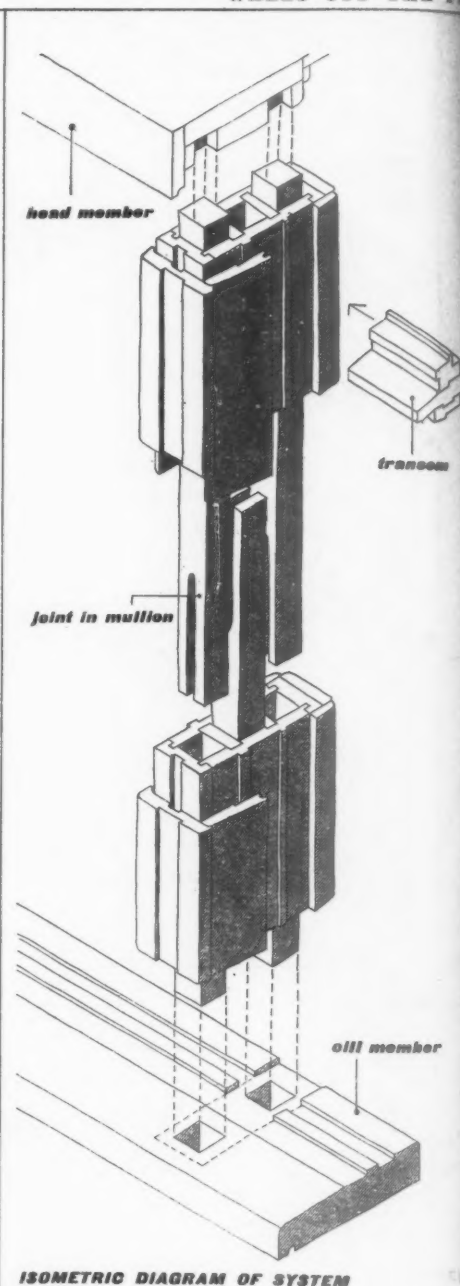
PLAN OF MULLION

NEWSUM 'CLADEK'

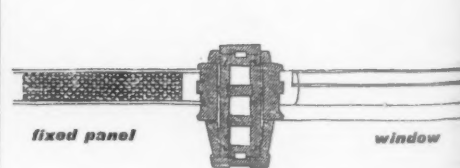
**Material Timber**

Cost Index: 50

**Note** This, like the other timber curtain wall, is a relatively new product but it provides an economic straightforward solution where it is permissible to use wood. The effect is very much robust than the tracery of steel or aluminium particularly as in this system the mullion is wide rather than deep so as to get the inside faces of panels, window surrounds and mullions to be in the same plane.



ISOMETRIC DIAGRAM OF SYSTEM



PLAN OF MULLION

JANES 'MODOLITE'

**Material Timber**

Cost Index: 80

**Note** The arrangement of timber is more complex in this design than in the other wooden curtain wall available, and the mullion almost resembles an oversize extrusion. The sleeve junction of mullion to mullion should allow for movement of the grid as a whole while the composite nature of the vertical member should, on the other hand, do something to restrain the movement of the timber itself. A number of mullion sizes are available to span various heights.



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continued from page 170

zontal sliding window consisting of frameless plate glass sliding in hardwood grooves would appear to be highly appropriate.

Resin bonded plywood has in the past been used for infilling panels. Unfortunately a certain amount of bleaching of the protective varnish is not uncommon. The development of a plywood which uses the natural weathering qualities of certain timbers seems in fact long overdue. Two timber curtain wall systems are now available in this country, one of which seems to offer great advantages from the point of view of erection.

### 3. glass

Glass in its clear form has been the inevitable infilling material in a certain proportion of almost every curtain wall. The use of obscure glass, or of clear glass with an obscure backing, in the remaining areas of the walls seems a logical extension. It is indeed in many ways an ideal material: it resists weather and corrosion, it will not burn, it may be had in many colours and textures, and it may be transparent, translucent or opaque. And yet there have been difficulties with glass in curtain walling. They can all be traced to incorrect fixing or the choice of the wrong glass.

It is essential that the glass is held in a cushioned position in which none of the stresses due to wind, thermal movement, building settlement or the addition of live loads are transferred to the glass. This means setting the glass in such a way that there is considerable clearance, a  $\frac{1}{4}$  inch is not excessive, around it, and that the members holding it are sufficiently rigid as to prevent any bending under stress.

Failure has also occurred through the use of wired glass. Wire in heat absorbent or coloured glass causes uneven thermal stresses and may easily lead to breakage. A clean-cut edge is also difficult to achieve with this type of glass, and there may thus be undue concentrations of stresses which will split the material.

Transparent or translucent glass with an opaque material a short distance behind it raises problems in the treatment of the cavity. If the cavity is not ventilated, condensation will under certain conditions form on the back of the glass which will then look streaked. If, on the other hand, the cavity is ventilated, it becomes very difficult to exclude dust and soot which will settle on the glass or the opaque surface beyond it. A dark colour would thus be advisable for such a panel if this latter solution is used.

Glass is available in many patterns and several finishes. The majority are, however, glossy polished surfaces which on a façade act as mirrors, reflecting the sky or the building across the street. The difference in tone value between these two reflections, for example, may be far greater than any existing on the elevation and new patterns therefore superimpose themselves on the design. This is as true of clear as of opaque glass unless the illumination level behind the clear glass begins to approximate the light out of doors. Only thus can one arrive at that transparent luminous quality which a

glass enclosed building seems to demand. So far perhaps it has only been achieved once: Skidmore, Owings & Merrills Manufacturer's Trust Company on Fifth Avenue dissolves the solidity of the enclosure.

### 4. plastics

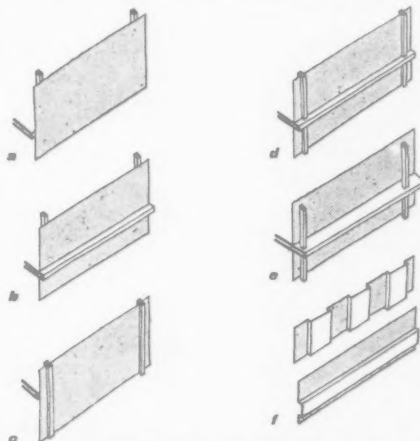
A phenolic based panel has been on the market for some time and now forms the standard infilling of at least one British curtain walling system. It was, in fact, used on one of the earliest examples, the Hertfordshire County Council's Clarendon School at Oxhey. Plastic window frames are manufactured in the States and a grid formed from box-shaped polyester fibre glass, for example, would pose no problems.

A number of moulders in this country are at this moment experimenting with such a box-shaped grid which would also act as permanent shuttering to the concrete frame, 11, and may soon in fact be able to market such a product. The resin can be coloured and the column and beam casings include flanges for windows and panels. Though such a plastic curtain wall seems perfectly feasible, it would hardly exploit the inherent possibilities.

The plastics, probably more than any other of the curtain wall materials, should be used not to form a lineal grid to be fitted with panels, but to create large sheets which do not need additional stiffeners, which include interlocking joints, which are partly transparent and partly obscure, and which carry their own insulation. That such a form may soon be a reality has in some measure been demonstrated by the Geodesic radar domes of R. Buckminster Fuller and the recent experiments in plastic houses in this country, France and the USA.

### the assembled wall

A distinction is sometimes drawn be-



12, a great deal of the visual effect depends on the relation of cladding to structure. A distinction is sometimes drawn between the condition shown in (a) which is labelled curtain walling, and that in (b), (c), (d) and (e), which is described as window walling. The problems of both techniques are, however, very similar and little seems to be gained by the distinction. Within each example the visual emphasis can again be horizontal or vertical, that of a balanced grid or it may also be non-linear, and, of course, the cladding need not necessarily be in a single plane (f).

tween an assembly projecting beyond the floor slabs and one spanning between slabs. The differences are more imagined than real and it would seem a pity to limit architectural expression by unduly emphasizing one particular form. A great deal of the variety possible in curtain walling in fact depends on the relation of the cladding to the floors and columns on both elevation and section, 12. In view of its derivation from patent glazing there has been an undue emphasis here on curtain walling as a predominantly vertical grid sheathing the building clear of the structure. A move away from this trend can be discerned on the second of the two new office buildings by Gollins, Melvin, Ward & Partners facing each other in New Cavendish Street.

### 1. climate

Both extremes of climate create their own problems in curtain walling. In hot areas shading devices are needed and an altogether more three dimensional approach than is at present usual in this cladding technique is required. Where curtain walls have been used in regions where shading is necessary, it has been usual to superimpose an outer layer of surfaces casting a shadow on the wall. It would also seem, however, possible to create a curtain wall which has depth which provides both shading and rigidity.

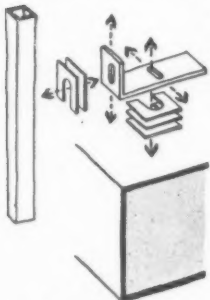
Much more serious difficulties exist in cold regions. Here, condensation, heat loss and cold radiation need to be overcome. Condensation will occur on any surface which has a temperature lower than the dew point of the air. The air inside a building usually has a dew point higher than that out of doors. If this inside air is allowed to pass through the wall, and if on its passage to the outside it finds a solid vapour barrier which is below its dew point, say an outer metal panel, it will condense on that surface. Two answers become obvious, either the inside face of the wall has to be a continuous vapour barrier or the outer face must be porous, or the cavity ventilated which amounts to the same thing, so that there is in fact no barrier.

Heat loss must be counteracted by proper insulation. Several of the infilling panels listed later include an insulating layer and have satisfactory 'U' values. If the insulation is also relied upon to give a rigid backing to a metal panel it is most important that the proper adhesives—the epoxy resins seem the most suitable at the moment—are used and that these are applied under carefully controlled conditions. Serious failures due to delamination have occurred and it has been necessary to replace large areas of paneling. Unfortunately, most walls as a whole are poor insulators due to the continuity of the metal. How serious an even small area of metal passing through from the outside to the inside may be is perhaps best demonstrated by an example. A square foot panel of two metal surfaces and an insulating layer between them has a 'U' value of 0.22. If a  $\frac{1}{4}$  inch diameter rivet should link the two metal faces the 'U' value will drop to 0.33 if the rivet is in steel and to 0.70 if it is in aluminium.

Only two of the systems available in this country go some way towards recognizing this problem. The problem is, of course, a great deal more acute in climates colder than England, but should not, on that account, be ignored here. This is especially true as a number of installations have been exported to Canada and the northern areas of the States (see 18). Much the same is true of cold radiation; it is perceptible in London, it becomes unbearable in a Canadian winter. Where there is metal which passes through from the outside to the inside without a break it may, despite indoor heating, become so cold on its inner face that a person standing near it will lose heat to that area and as a result feel cold. This can quite easily happen with a box mullion, for example, which presents quite broad areas to both the inside and outside and which from the point of view of cold radiation may thus greatly reduce any benefit derived from double glazing and well insulated panels.

## 2. erection

A curtain wall is an engineering product with tolerances of about  $\pm \frac{1}{32}$  inch. Few structures will have comparable precision. The relation between these two building elements must, therefore, be designed in such a way that adjustments can be made during erection. Most manufacturers do in fact supply brackets or shoes tying the curtain wall to the floors or framing which have slotted holes or some similar device, and these fixing devices should always be included in the tender of the curtain wall manufacturer, 13.



13, the four degrees of freedom necessary in the attachment of the curtain walling to the structure. This diagram is taken from 'Curtain Walls of Stainless Steel', a study prepared by the Princeton University School of Architecture, which is, despite its emphasis on one material, in many ways the most useful publication on curtain walling in general.



14, curtain walls should, whenever possible, be tested after installation. Flooding the facade for a number of hours from a pipe mounted some way beyond the roof, or spraying it from a fire hose from the ground, provide useful tests.

## 3. maintenance

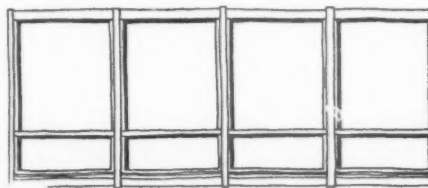
Most so-called traditional materials need heavy maintenance—repainting, painting

and replacement—at infrequent intervals; curtain walls, on the other hand, need little maintenance—cleaning—frequently. This difference means that all parts of the elevation should be accessible. In low buildings this can obviously be done from the ground, in high buildings cradles become necessary unless the wall spans between floor slabs and it can be cleaned from protected ledges. It is seldom sufficient to clean only the opening window areas or to assume that the rest of the wall can be properly reached from these openings.

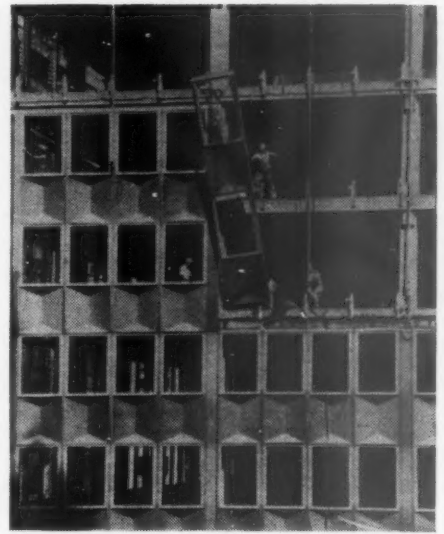
## Potentials

None of the problems just discussed is by any means insoluble and all are certain to be overcome in the next few years. Yet even then only the first steps will have been taken. If the curtain wall is not to degenerate into the new cliché of the second-rate, a great deal more development work, both technical and visual, will have to be done in the immediate future, and the demand for such experimentation must come from architects aware of the potentials of the emergent technology.

The first step in the technical development of the curtain wall in this country would seem to be to cease to consider it as composed of a linear grid of metal or wood struts joined to each other on the site, and into which weatherproof flat panels are then inserted. All but one of the eighteen systems shown starts off from this assumption. It would seem logical to fabricate much larger units in the factory, in fact complete wall elements which incorporate solids and voids and which contain their own joints. Such an assembly was, of course, used as long ago as 1952 by Harrison and Abramovitz on their building for Alcoa in Pittsburgh. We have probably not seen it here because so far curtain walling has been largely confined to low buildings such as schools or factories and the great practical advantage of the larger assembly lies in the possibility of the entire cladding being done from the inside without scaffolding, 16. The cladding unit of the Alcoa building was as die stamping produced on the presses of the makers of Pullman railway cars but the use of large elements does not necessarily presuppose such an expensive process. A series of extrusions or steel sections, panels and windows can also be jointed into an assembly in the factory so that only large units are coupled up to each other on the building. A method of using pre-assembled steel units somewhat along these lines was developed by Peter and Alison Smithson in conjunction with a manufacturer and carried out on their school at Hunstanton, the most virile

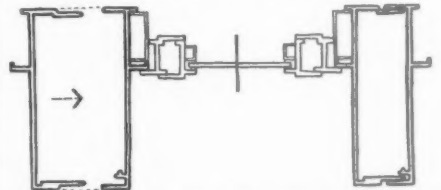


15, the storey high 9 ft. by 21 ft. grid which forms the cladding unit on Mies van der Rohe's most recent Chicago apartment buildings. The grid is in aluminium and is anodized in its assembled form.



16, Davies Building, 460 Park Avenue, New York. Aluminium skin panel of 2-storey height being erected on facade. Panel anodized, grey in colour; aluminium windows centrally pivoted

example of curtain walling so far seen in this country. These elements can become quite sizeable and pre-assembled into units 9 feet high, 21 feet long anodized in their assembled state are being erected on Mies van der Rohe's Commonwealth Promenade apartments in Chicago, 15. Such large units greatly reduce the number of joints which have to be made on the site and are much more likely to produce a weathertight wall. The smaller amount of jointing makes it also possible to use some of the more expensive and certain ways of sealing. The easiest way to achieve such a unit is to use a split mullion and join the panels and windows to a half mullion on each side, 17. Strangely enough, only three of the systems available have

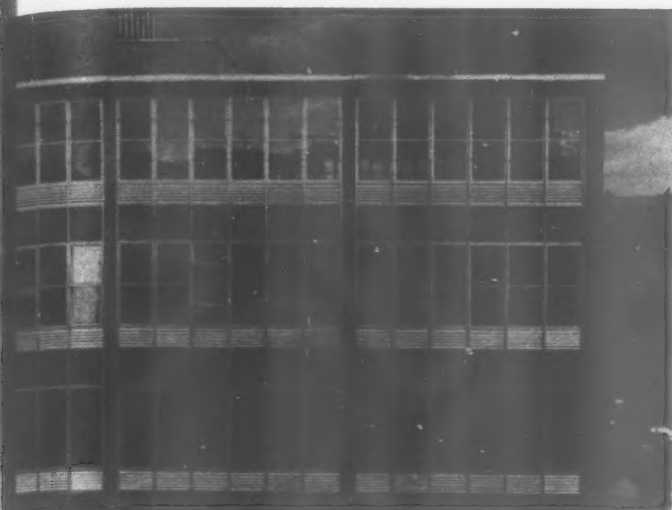


17, a curtain walling system using interlocking aluminium mullions. Fabrication tolerances and thermal expansion are absorbed in the overlap of the two parts of the mullions. Such a system makes it also possible to install windows and panels into the grid before erection.

such a mullion form, and in only one case is it used as part of a completely pre-assembled unit.

The production of larger units merely takes the curtain wall out of its most primitive state. It does not significantly change its function or character; it is only the logical second step in an industrial process.

The second and urgently needed next step would seem to be to enlarge the function of the wall. The curtain wall has on the whole been considered merely as the outer waterproof layer of a building. It sometimes incorporates heat insulation and it occasionally includes the inner face of the wall area below the windows. It rarely, however, considers the fact that interior partitions may join the wall, that there are junctions with floor and ceiling finishes, that there may be sunshine and glare



18, Commonwealth Bank, Ottawa. Williams and Williams 'Wallspan.' See facing page.

control devices inside and outside, that sound control, heating, lighting or air conditioning may have to form part of the enclosure of the building, that the spread of fire needs control. These considerations demand both technical changes and different attitudes to the problem. The spread of fire, for example, cannot be adequately controlled by any of the materials now in use for curtain walling. A different material is, therefore, needed or, alternatively, new ways of control need to be considered which are related to this type of cladding. Internally, sprinkler systems have made certain forms of construction possible; there is no reason why a system of external sprinklers flooding the wall surface should not also, as regards fire spread, satisfy a code written in terms of performance standards. Technically, it is a perfectly feasible device which might also incidentally be used for cleaning the façade. The important point in all these considerations is that the curtain wall must not be considered as an isolated and unrelated building element.

Technically the potentials of the curtain wall would seem to lie in two parallel directions: in it becoming part of an integrated system of industrially produced components and at the same time a complex and multi-purpose cladding unit. Both of these demand a further concentration on industrial production, and can thus be seen as merely part of the general technological trend. Experimental developments in both of these directions are in fact under way.

Something like this has, of course, to some extent already happened in ceiling construction. The ceiling developed by Wakefield for Saarinen's General Motors Technical Centre, probably the technically most accomplished building in the world, is a system of modular components which includes lighting, acoustic baffles, air outlets for heating or air conditioning, sprinkler heads and top fixings for internal partitions. The Wakefield ceiling is now commercially available and there seems to be no reason why curtain walls of similar versatility should not also be in the manufacturers' catalogues.

A large number of technical advances

hold out considerable promise in the development of a multi-purpose curtain wall during the next ten or twenty years. Three of these—the printed circuit, thermo-electronic heating and electro-luminescent lighting—have recently been given some architectural publicity. The printed circuit embedded within the plastic sheet at the time of manufacture may become an important technique in supplying the greatly increasing number of electrical business machines coming into use. Thermo-electronic heating and cooling now being studied by RCA would appear to make it possible

to produce quite thin panel-like units which would heat or cool a space depending on the direction in which the electric current is passing through a large number of small pieces of dissimilar metals joined in series. Electro-luminescence, the light glow produced by a phosphor-coated film between two electrodes, similarly opens up the opportunity of using very thin light sources in sheet form as part of a wall. The architectural implications of such research, especially the last two, are radical and must significantly affect the internal and external appearance of buildings.

#### additive architecture

The appearance of curtain walling even in its present form has been unnecessarily stereotyped. This is, unfortunately, especially true of buildings in this country which all have an extremely unmodelled surface with a predominantly vertical emphasis. Neither characteristic is inherent in the technique. Some of the rare pre-war examples of curtain walling, Le Corbusier's flats at Geneva or the Pavillon Suisse, do not, interestingly enough, in any way foreshadow such limitations.

Certain post-war examples abroad have also avoided such a limited vocabulary. Mies van der Rohe has at 860 Lake Shore Drive shown the possibilities of developing some form of modelling through the use of a repeating dominant projecting member, in that case an 8-inch R.S.J. Bernasconi, Fiocchi and Nizzoli's Palazzo Olivetti, 19, achieves a completely different

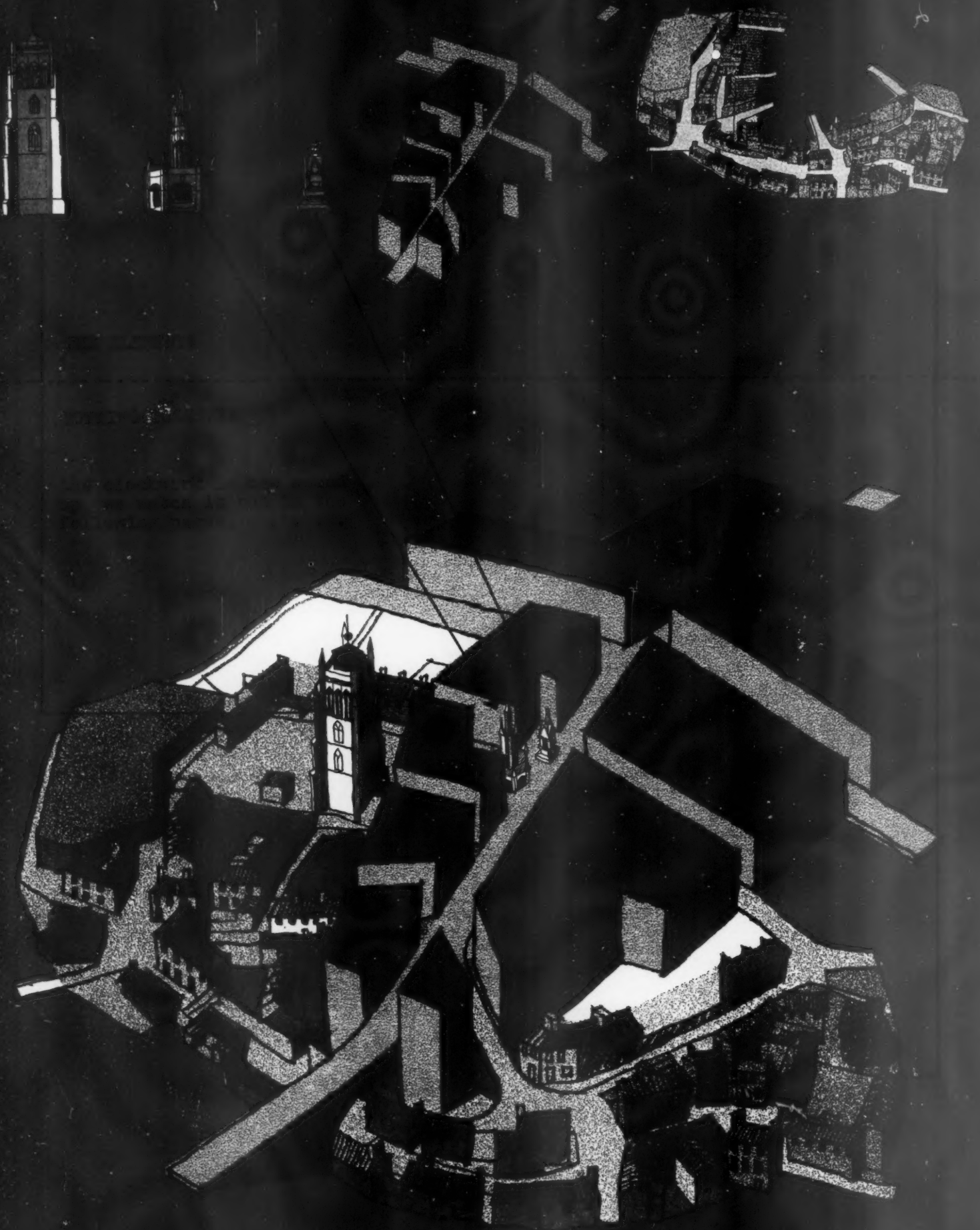
kind of depth through its double-layered wall. Glare control is needed even in London and may usefully become part of the curtain wall. Some of the expressive complexity of patterning which can be developed can be seen on I. M. Pei's Mile High Centre office building in Denver where there is a colour differentiation

between the structure and the vertical and horizontal air conditioning elements exposed on the facade. Colour patterning of a different kind was used by The Architects' Collaborative on a number of their latest buildings. And that curtain walls need not be made up of identical units was beautifully demonstrated by Charles Eames on his showroom for the Herman Miller Furniture Company in Los Angeles. Nor for that matter need curtain walls always be composed of windows and panels; they can equally well be made up of doors—sliding, hinged, folding—with balustrading inside or out, of solid sliding panels, of louvred areas, or of completely solid cladding as in the industrial sheathing from which so much of the curtain walling technique is derived.

The aesthetics of curtain walling are those of additive architecture. This, unlike the carving out of space so characteristic of masonry construction, might perhaps best be described as the manipulation of space through individual and defined units which, in their multiplicity, create an architectural volume. Something like this can, of course, be felt in certain examples of Japanese architecture and something of the richness and variety possible can perhaps be deduced from the recent sculpture of Harry Bertoia. What we have not yet experienced, however, is an additive architecture of industrial elements which in any way approaches the subtlety of the Katsura Imperial Villa or the brilliance of a Bertoia gold screen. There is no reason, though, why it should not.



19, Palazzo Olivetti, Milan. The movable sunbreakers are aluminium; the column covers behind them are black anodized aluminium and in the low block, right foreground, the infill panels are marble.



This article on Shepton Mallet is the second in the series of townscape studies in the West of England undertaken in collaboration with the University of Bristol.

## TOWNSCAPE

Gordon Cullen

# SHEPTON MALLET

1, 2, 3, a unique entrance: from open fields to the centre of the town by unbroken pedestrian ways.



1  
The elements of this town are simple enough. A High Street: more or less a straight line of shops, narrow and sloping uphill to widen in the middle forming a town centre containing town hall, library, etc. Also one or two monuments, a residential area and the county gaol. It is in the way the elements are put together that the true magic of townscape is released. Magic, a strange word to use in this connection, but I make no apology for using it.

Suppose that in an idle moment one fits two pieces of cardboard behind one's glasses with a little hole in each through which to see. The first thing that happens is that by cutting out all marginal vision we find it difficult to navigate for our feet are invisible. In smoking a cigarette the hand appears suddenly and without warning into view, it is remote and could be someone else's hand.

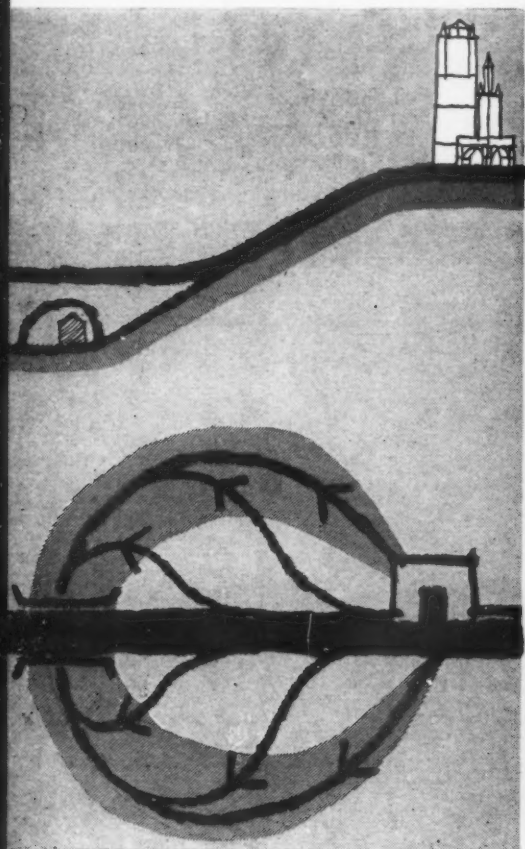
2  
But we still have vision, a telephone is a telephone and a book can be read. Thus, for a joke we have divided vision into two things: First there is the practical or animal vision by which we are aware of all the objects that could trip us up or harm us . . . self-protective vision. Secondly, there is the sort of vision we use for looking at something with intent such as a book or a piece of machinery or a face or a view.

3  
In town design and town appreciation, there are also two worlds, the animal world of self-preservation, of marginal sight, and the civilized, or magic, world of beholding.

The animal world is governed by the laws of economics, of practicability, of considerations for health, convenience and comfort. By observing these rules we can assemble in a given place a whole cluster of utilities



4,5 On this page we see details of the critical point where the pedestrian town runs under the High Street as explained in the diagrams to the left (in which the High Street is shown by colour and



the pedestrian town as a radiating tint). 4, view looking down the High Street; no trace of pedestrian way. 5, looking down on to the pedestrian town from the bridge. 6, the twin bastions of the High Street seen from below; the town starts clean and sharp. 7, the continuity of the pedestrian town under the bridge.

which yet fails to become a town unless we simultaneously employ civilized vision which obeys its own rules obtaining to scale, colour, texture, height, width, narrowness, and the deployment of these qualities to the end of creating a sense of place.

I mention all this, obvious though it is, since there are many who deny the function of civilized vision. It is disparagingly described as stage setting, it is regarded with puritanical suspicion. ('Back to reality. Our town is not stage scenery designed to please fashion-conscious visitors. It was built and is today planned to fit the needs of its citizens who pay for it and pay the salaries of

those who have to deal with its problems of housing, traffic and amenities.'))

Is it stage scenery to bring into the open, that all may see, the actual truth of a given situation? For example, suppose you visit one of those precariously perched hill towns in the south of France and after ascending the winding road and finding yourself in a narrowly built-up village you decide to have a drink. You enter a cafe and your drink is served on a balcony which, to your delight (or horror), is cantilevered out over a drop of several hundred feet. The fact that this is a hill town is now dramatically made evident to you. Is this false or



8

9

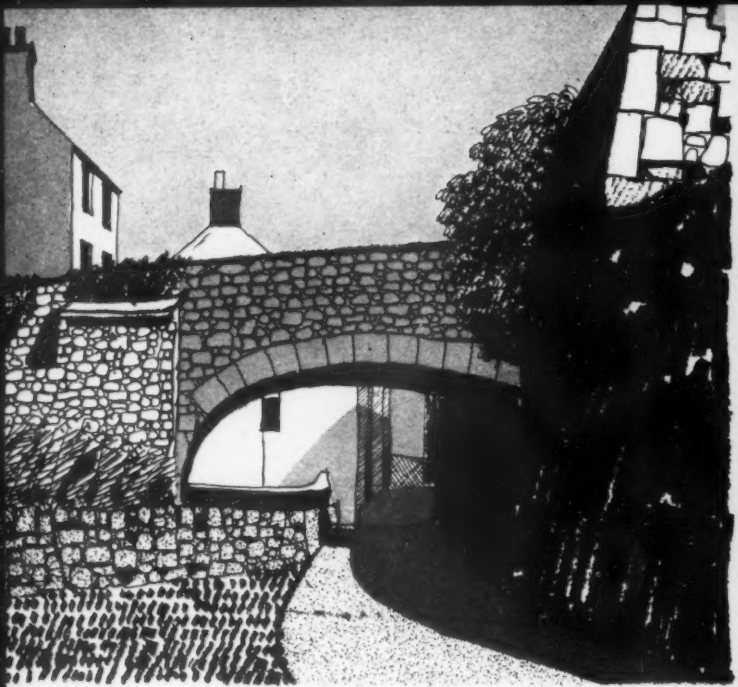
8, 9, the pedestrian town flows from the High Street, quiet and urbane, revealing variety of scene . . .

true? Is it stage setting or is it a deeper penetration into the truth of the situation.

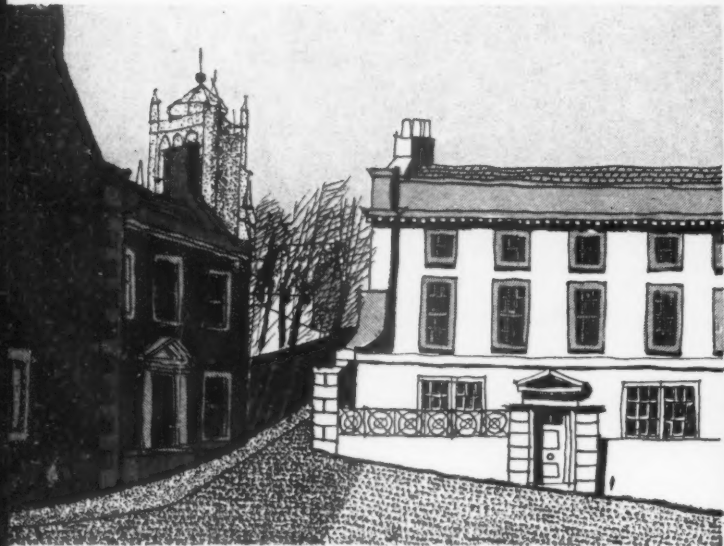
Shepton Mallet is, at first glance, a somewhat dull little town; you can drive through it in a few minutes and only see a narrow High Street, the Market Cross and a glimpse of the church tower. But if you stay a little to explore, one or two curious things happen—branching off from the High Street are smaller roads and lanes which also slope downhill and lead to a tranquil system of pedestrian ways and rough squares composed of dignified stone houses. The contrast to the crowded High Street is complete and, as you wander along, the road turns and you discover a new shopping street. But is it? It is just like the one you left. It is the same High

Street. How did you get back to it? Certainly you haven't crossed it and yet you are now on the other side of it. If we imagine a flat earth voyager sailing forever westwards and, on hearing 'Land ahoy', studying the topography of the new continent only to find it suspiciously like the port he left his surprise is similar to that experienced by the wanderer in Shepton Mallet. The illusion is created by the fact that although the High Street slopes down the pedestrian ways slope just a bit further and end up at a lower level, although this could not be guessed since it is invisible on leaving the High Street. The High Street crosses the residential town by means of a bridge and the illusion of all roads sloping uniformly down to a common level results in

# TOWNSCAPE



10 . . . narrowness and netted view, 10, suddenly widening out to reveal the quiet but spacious square, 11, and finishing,



11 before the countryside, in a very good example of closure, 12. The last building, a convent, holds the eye to the last moment (see plan below).



the bridge, when it is seen, being regarded as any old bridge but certainly not the High Street.

In this way the unity of the lower town is complete. It radiates out from both sides of the High Street in a natural organic way, but the High Street does not cut it in half, thanks to a well-handled change of level. In a town so small, to have bisected the quiet, residential area would have been to destroy it. Instead of being an enveloping layer to the High Street it would have been two disconnected lobes. In reality it is a unity throwing out tentacles into the green fields and feeding into the High Street, but also uniquely and privately itself. For the High Street, too, there are benefits. One enters with a bang, from green fields to the two bastions that flank

the end of the street.

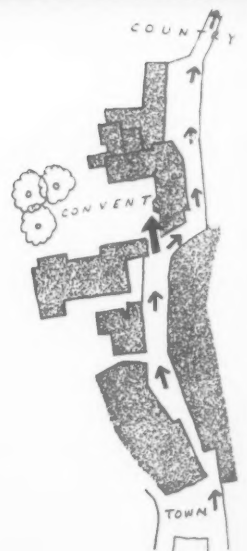
And complementary to this disposition of the main parts of the town is the sense of intensification that can be observed in the town centre itself, the point where the two towns come together.

There are two things to notice in the treatment of this important place:

- 1, intensification of space;
- 2, intensification of height.

Both are produced by the disposition of the monuments, the catalysts: fountain, cross and church tower.

The first point, intensification of space, is to be seen in the same market place for whilst there is on the one hand an emphasis on height there is at the same time a





13



14



15

But to return to the Market Place, we see how this place is made more vivid and real by two forms of intensification. Above, the spatial intensification due to netting. 13, as it really is, 14,



16



17



18

the illusion of crowding in (one's memory of the Market Place). 15, the general effect. Below, intensification of height; a linked sequence of pictures, 16, scale is established by the fountain which accentuates the height of the cross, 17, by contrast. Finally the ultimate height, 18, the church tower is revealed.

## TOWNSCAPE

peculiar sense of crowding in of the walls of the enclosure giving a wholly admirable sense of presence. It really seems to be what it is, the town's outdoor room. This is doubtless due to the fact that the enclosure is seen mainly through the low arches of the cross and the effect of netting is to particularize what is seen beyond.

Secondly, we approach the market place along Great Ostry, in front is a narrow cross road (the High Street) in which is situated one of those sombre Victorian drinking fountains. It is only about 8 ft. high, but it asserts its own particular scale on the scene. On turning the corner the market cross is now seen and although

it is not large the sudden change of scale makes it appear the larger by contrast. Finally the full view reveals the ultimate height, the church tower.

It was remarked earlier that Shepton Mallet is a dull little town from a purely architectural point of view. It may be thought now that, even so, it has revealed a pattern in its make-up not without interest to town builders. Out of its simple and unassuming parts a town has been created which has personality. It is not a random collection of utilities all busily saving the precious ratepayer's money. It is a town which almost nudges you and says 'Look at me. I'm here.'

# HOUSE AT WATFORD, HERTS

ARCHITECTS

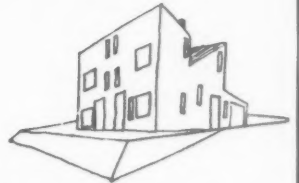
ALISON AND PETER SMITHSON

*The architects write:*

On the whole the English still resist really large windows and are happiest with the Tudor cottage. This is probably because the Tudor cottage looks as if it would protect you from the outside and feels as if it fits you on the inside. The English post-war house is the pre-war house with the windows enlarged into the brick areas: as the windows are usually one above the other the house is divided into a multitude of vertical strips in which neither wall nor window dominates and which as a volume is neither penetrated, nor a fully realized solid (see inset below). The distribution of windows in this house allows the brickwork to flow together and coalesce with the roof to form a solid mass, with that appearance of all-round protection once the characteristic of English popular architecture.

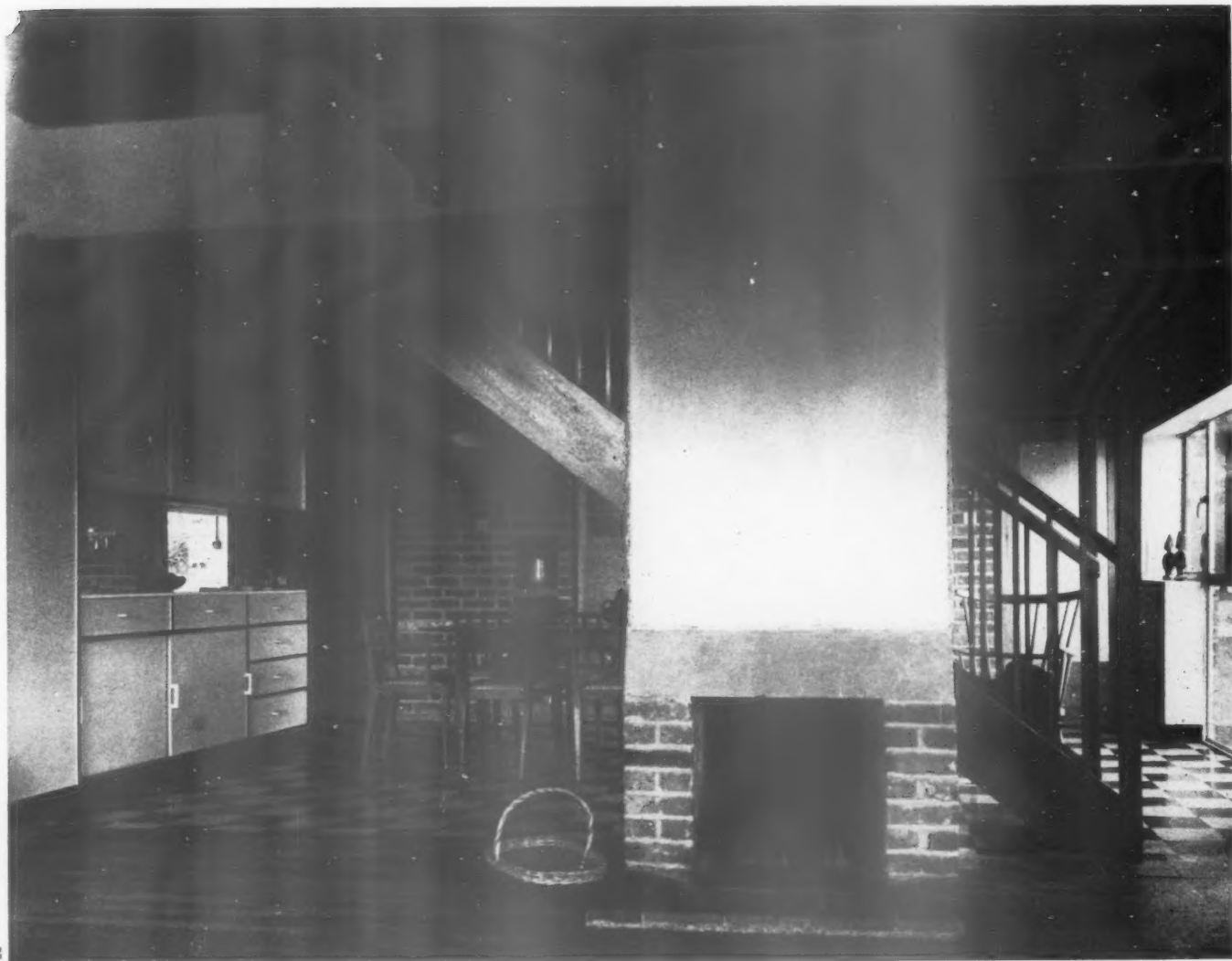
The house is on the northern edge of a 'residential estate' in Devereux Drive, Watford; a sample estate house is shown below left. The estate put certain restrictions on the materials to be used, and it finally became obligatory that the design should be based on the external materials: second-hand London stock bricks, dark red tiles, and standard metal windows. Two schemes were prepared by the architects, both with the same aims: *a*, To make the shapes of the rooms fit the functions as closely as possible, by varying room heights and by break-out sideways. *b*, To tailor the profile of the building as closely as possible to the room shapes. *c*, To use the materials in a straightforward and therefore economical way. *d*, To use standard window components repeated or grouped together.

The first scheme, (inset right,) was rejected by the client; the second scheme was approved by both client and estate, but was rejected by the local authority after four months of fruitless discussion. On appeal, the design was allowed, ten months after application had been made to the local authority. The functions are grouped into strips of varying height, the dividing walls between holding up the roof; the house is intended to look like a blackish solid block pierced with windows in the manner of Vanbrugh Castle, Blackheath.



1. south-west elevation.



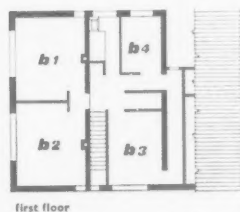


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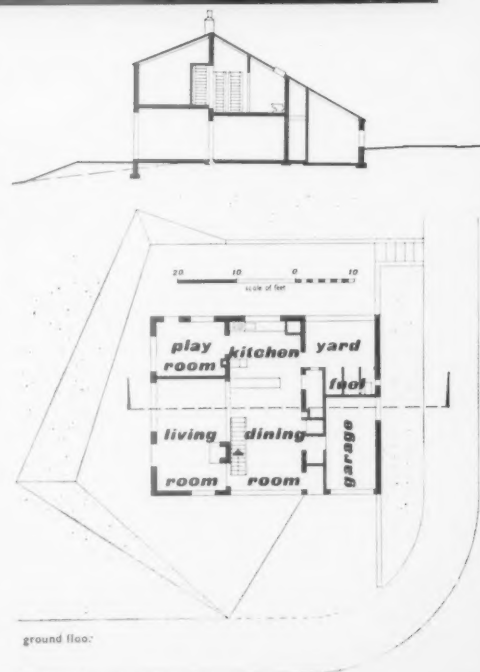
2. looking from living room to dining room around the central flue. Limewash plaster is about  $\frac{1}{2}$  in. thick, mitred at the edges; exposed wood ceiling joists and r.c. beam.  
3. French window from living room to garden set in the 'dark zone' of the living room. The effect produced is a small scale edition of the effect of the windows in the whole façade, opposite.



3



first floor



ground floor



4

brickwork (internal and external): second-hand stock bricks in slightly tinted grey mortar.

structural timber (joists, wallplates, stair, etc.): Columbian pine, french-polished.

roofing: dark red concrete tiles; rain-water goods asbestos.

upper floor ceiling: Columbian pine match-boarding, french polished.

lower floor ceiling:  $\frac{1}{2}$ -in. hardboard (rough side down) with fibre-glass quilt above; t. and g. boards on battens to first floor, laid on quilt.

floors: living-room and playroom loliondo strip; kitchen, dining-room, hall, bath and w.c.,



5

polyvinyl tiles; bedrooms, tongued and grooved boarding, finished with patent sealer.

doors: deal framing, t. and g. panels, french-polished.

garage door: 'up and over,' aluminium-faced.

door furniture: aluminium alloy levers.

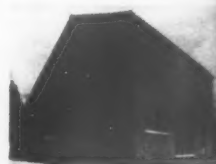
windows: standard and 'Z' range windows.

plaster: lime putty, gauged with gypsum plaster.

fittings:  $\frac{3}{4}$ -in. blockboard ('box frame' construction) painted eggshell-finish; grey, black and white.

kitchen and bathroom tiles: white 4 in. by 4 in. glazed tiles, with eggshell finish.

heating: on ground floor, underfloor panels; bathroom, radiator.



6



4 and 5, kitchen from opposite ends looking towards yard and playroom respectively. Exposed boiler coloured mauve; the kitchen cabinet is deliberately simple to avoid the clash of glossy fittings and a homely

interior: the architects were trying to create a Dutch middle-class atmosphere. 6, from the south-west. 7, looking from dining room to kitchen; doors on right to yard, larder, closet and garage respectively.

All fittings were selected off-the-peg: light fittings proved the most troublesome to select, all 'contemporary' models being over-designed for the effect aimed at here.

7



8. covered yard and kitchen from the west. 9. stairwell with plastered flue on left; an unobstructed view up to the roof pitch produces the same kind of spatial break-out in a vertical plane as the open plan achieves horizontally,

as shown in 10 below. a composite photograph of dining room staircase, and flue and living room. The windows carefully frame views across gardens with solid walls concealing the houses in between.



9



10




11



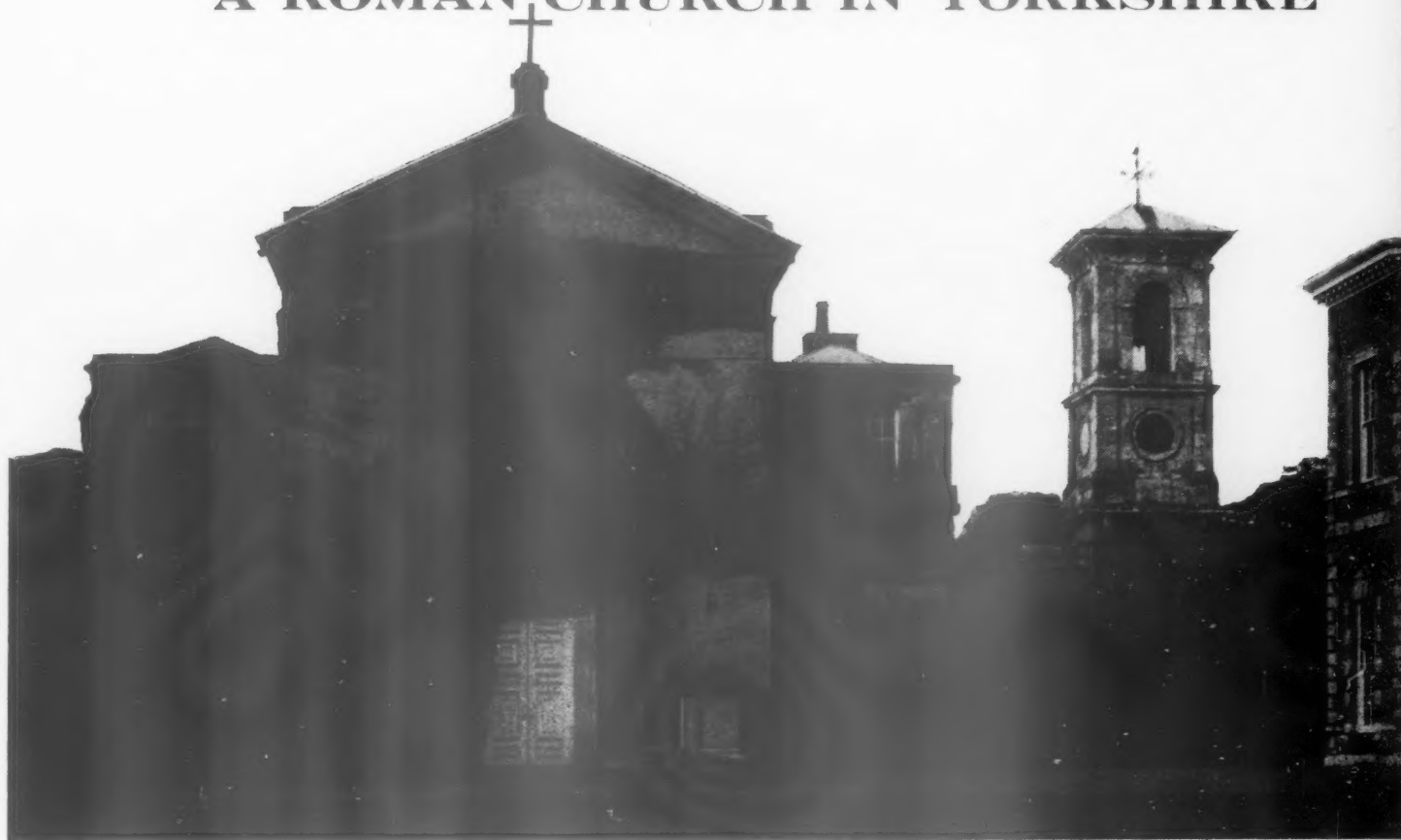
12

11. south-east elevation with front door and garage. the windows are the standard frames rearranged to maintain the idea of the dominant brick envelope whilst letting in the same amount of light. 12. the same elevation from the south.



With its stately procession of attached Corinthian columns, its noble entablature, coffered vault and domical apse, this might well be the grave nave of some Neo-classical church in Rome. But it stands within the spiritual, not the temporal city, and its physical location is at Everingham in Yorkshire. In the article which begins on the facing page, Hugh Honour describes how such a church came to be built in the late eighteen-thirties.

## A ROMAN CHURCH IN YORKSHIRE



1, the entrance to the Roman Catholic church at Everingham, Yorkshire, originally the private chapel of Everingham Hall, which stands to the right.

It is not usual to refer to the *Album di Roma*<sup>1</sup> for the only full account of a Yorkshire church, and indeed, one hardly expects to find the rich Italianate church of Everingham in the flat country between York and Selby. But if the *Album di Roma* has few surprises, the Yorkshire countryside has many and this church must be one of the most delightful.

Everingham is a small straggling village with a somewhat dilapidated Anglican church. From the south end of the village street a drive leads to the plain eighteenth-century Hall, which is partly the work of John Carr of York.<sup>2</sup> Beside it stands the Catholic church, originally intended as a private chapel. The high, honey-coloured walls are unbroken by windows and consequently give it a somewhat severe aspect.

The richness of the interior bursts on the visitor as he enters, passing in a moment from Yorkshire to Italy. As the light comes from windows high above the frieze, the

whole roof is brilliantly lit and appears to float above the building; in the apse, the light filters down from a dome. From the control of natural light the church gains much of its effectiveness and it has true Roman neo-classical feeling.

From archives formerly kept at Everingham Hall, but now at Ampleforth, it appears that the idea of the church was conceived some time before 1836. In that year John Rice wrote from St. Augustine's College, Rome, to his patron William Constable-Maxwell of Everingham saying, 'I have paid Leonardi several visits—He has the selection of the rarest and most beautiful materials now in his workshop.' Leonardi, presumably a marble cutter, is later mentioned as the author of the altar; so it appears that from the beginning Constable-Maxwell had determined to build a church of true magnificence. William Constable-Maxwell, 10th Baron Herries, came of an ancient Scottish family which had held to the Roman faith. The 5th Earl of Nithsdale and 9th Lord Herries had been involved in the Jacobite rising of 1715, taken prisoner at Preston,

attainted for treason and condemned to death. He escaped while waiting for execution and died in Rome, faithful to the Pretender's cause. Had it not been for the attainer, Lord Nithsdale's granddaughter would have inherited the barony of Herries, but neither she nor her eldest son appears to have applied for a reversal of the act; her grandson, William Constable-Maxwell, the builder of the church, claimed the title successfully in 1858. Yorkshire had been a stronghold of Catholicism throughout the seventeenth and eighteenth centuries, but only in the nineteenth century did the great Catholic families build their vast chapels,<sup>3</sup> in celebration, one might almost say, of the act of Emancipation.

There is slight confusion over the authorship of the church. According to the *Album di Roma*, it was designed by a Roman architect, Agostino Giorgioli; but his name is not mentioned anywhere in the accounts and letters I have examined, from which it appears that John Harper

<sup>1</sup> Oreste Raggi: 'Nuova chiesa nella Contea di York' in the *Album di Roma*, A. VII (1840); distr. 9.

<sup>2</sup> There are a number of tinted drawings for the interior much in the style of Carr, one of which is inscribed J.C., among the Everingham papers now at Ampleforth College.

<sup>3</sup> The other two large Roman Catholic chapels in Yorkshire are both Gothic, one being a copy of the York Minster Library, at Brough Hall; the other is at Budding Park.

was the architect. It is not improbable that Giorgioli, who seems to be otherwise unknown, provided no more than the original plans which were later worked up by Harper. John Harper had been a pupil of Benjamin and Philip Wyatt for whom he had worked on Apsley House and the Duke of York's column before he settled down to practise in the north of England, but he died at the age of 33 in 1842. He would appear to have modified the Everingham plans, and the Ionic portico of which the *Album di Roma* contains an engraved view was not in fact constructed. The plasterwork, including the fine Corinthian capitals, was done by the firm of Crabtree of York whose most complete account was dated 1839, presumably the year the church was finished.

Not all the credit for the interior can go to the architect, or architects, as the statuary makes an immediate impression. In all there are sixteen full-sized figures, representing the Virgin, St. John, St. Mary Magdalene, St. Everilla and the Twelve Apostles; in the frieze there are eighteen low reliefs of the life of Christ, all the work of a young Carrarese sculptor, Leopoldo Bozzoni. It is said that the marble reliefs and statues were carved in Rome and then sent to England and that the ship bearing them sank on the way. Consequently

Bozzoni had to come to England to execute another series, but as it would have been too costly to use marble, cast stone was used instead. There is no means of verifying or of denying this account which does not seem impossible. The known facts are that in 1838 the altar by Leonardi was sent to England and in the same year Bozzoni arrived in London and took part of the ground floor of the Hotel Imperial, Covent Garden,<sup>4</sup> as his studio. Between 1839 and 1844 Constable-Maxwell paid him £1,780 and there is a note to say that £640 was still owing in 1845. In 1844 Bozzoni exhibited the figures of St. Andrew and St. John in Westminster Hall before despatching them to Yorkshire. The critic of *The Literary Gazette* remarked of the pair that they had 'good modelling about the drapery though as much cannot be said for the figures.'

With their stiff beards and hard drapery, the figures at Everingham reflect the very strong influence of Bertel Thorwaldsen. According to Campori,<sup>5</sup> the biographer of Carrarese artists, Leopoldo Bozzoni obtained in 1824 the premium for low relief carving at the Carrara Academy and was sent to Rome to continue his studies

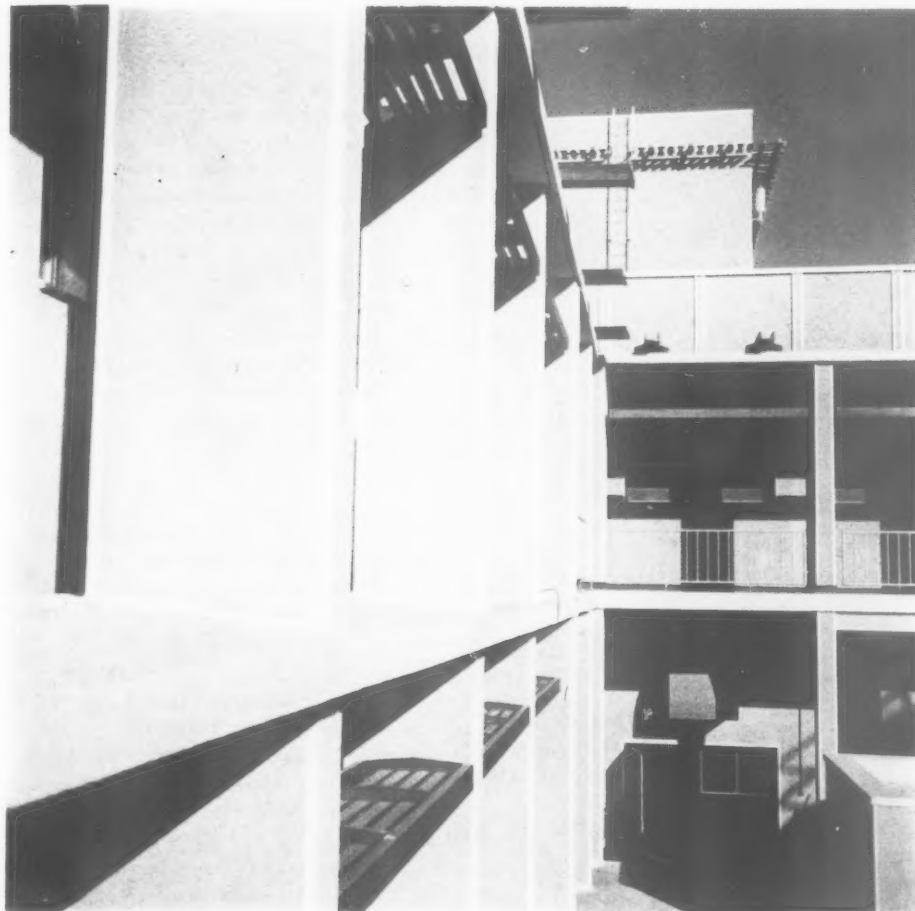
under Finelli. Canova having just died, Thorwaldsen was left the undisputed champion of sculpture in Rome and it was to him that Bozzoni naturally turned for inspiration. From Rome he sent figures of Mars and Ajax to the Academy of Carrara, but like so many gifts to that institution these appear to have vanished. Campori states that Bozzoni did not meet Constable-Maxwell until he came to England and was commissioned to do the work for Everingham, and cites as his only other sculptures figures of St. Peter, St. Paul and St. John. He was able to exhibit 'a subject from the Aeneid' at the Royal Academy in 1847, and he probably died in the same year. From the Everingham papers it seems likely that the other three figures mentioned by Campori were destined for the Catholic church at Clifton, but they were of plaster and no trace of them survives.

Since it was completed in about 1839, and the niches were filled in 1844, few alterations have been made to Everingham church. The altar was enlarged a little in 1868, but this seems to have been done discreetly. It is tempting to call it the most impressive Catholic church in England; it was surely the first really fine one to be built after the seventeenth century and stands as a great monument to the spirit of Catholicism in the 1830s.

<sup>4</sup> See Rupert Gunnis: *A Dictionary of British Sculptors*, p. 60.  
<sup>5</sup> *Memorie Biografiche degli Scultori Architetti, Pittore ec. . . di Carrara*. 1873, p. 37.

2, the interior looking towards the entrance; on the right are some of the statues and low reliefs representing the life of Christ, by the Carrarese Leopoldo Bozzoni.

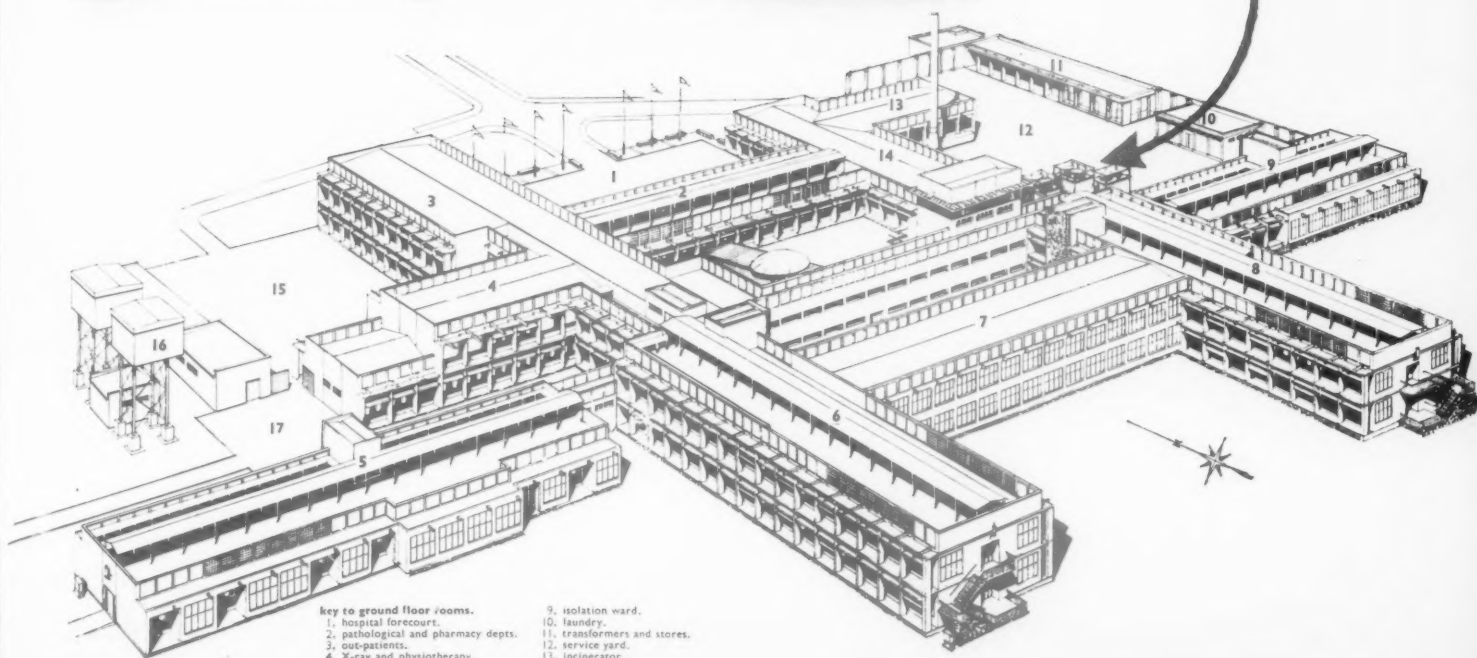




STATE HOSPITAL AT DOHA

ARCHITECT: JOHN R. HARRIS

1, junction of isolation ward and main hospital.



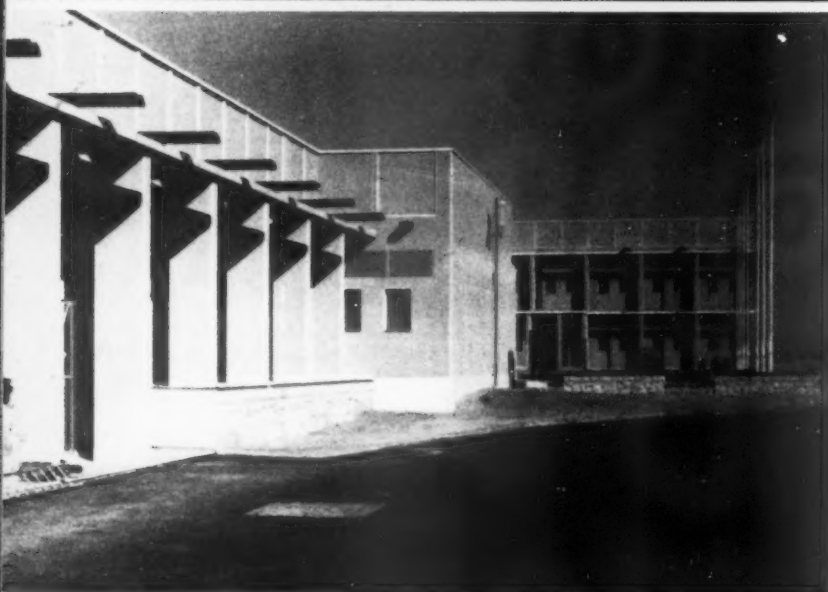
key to ground floor rooms.

- |                                     |                               |
|-------------------------------------|-------------------------------|
| 1. hospital forecourt.              | 9. isolation ward.            |
| 2. pathological and pharmacy depts. | 10. laundry.                  |
| 3. out-patients.                    | 11. transformers and stores.  |
| 4. X-ray and physiotherapy.         | 12. service yard.             |
| 5. obstetric wards.                 | 13. incinerator.              |
| 6. male surgical wards.             | 14. kitchens.                 |
| 7. 4-bed wards.                     | 15. staff and ambulance yard. |
| 8. male medical wards.              | 16. water towers.             |
|                                     | 17. mortuary yard.            |

axonometric of hospital from north-east.



2



3



4

## State Hospital at Doha

Doha is the capital of Qatar, an independent state on the Arabian side of the Persian Gulf; this hospital was the winning design in an open competition held in 1953. The site is on the desert escarpment half a mile to the west of Doha, and as well as the hospital buildings it contains 11 senior houses, 4 self-contained flats, 12 sisters' flats and 56 nurses' quarters. The hospital was the first large framed building to be constructed in Doha and almost all building materials, except sand, aggregate and stone, had to be imported; it was decided that by using the best aggregates and specifying the water source, *in-situ* reinforced concrete using local materials would be possible: the main framework is steel, prefabricated in the UK and shipped to Doha after a trial erection. Floors and roofs are a combination of precast prestressed tile plank with infilling hollow concrete blocks and an *in-situ* topping of concrete to remove the need for shuttering. Expansion joints were formed at approximately 100 ft. maximum intervals by using two steel frames, one on either side of the expansion joint, each supporting the building on its respective side and giving 1 in. complete separation between the blocks. The cost of importing bricks for panel walls would have been heavy; to avoid this local shell sand concrete blocks were used, made on site in machines imported for the purpose. Similarly, the hollow tile pots and trays required for the floor construction and engineering bricks required for lining the basement excavation and some structural walls, were replaced by shell sand hollow pots and trays, and solid concrete blocks. The external walls have concrete vertical fins and canopies with teak and pine subsidiary sunbreakers. Light to the medical and surgical single-bed wards is controlled by aluminium sunbreakers. The hospital services include full air conditioning for the main building, with an independent plant for the theatres. There are also independent refrigeration, ventilation and cooling plants for the animal room, chilled piped drinking water, meat room, fish store, ice cream freezer, therapy plant cooling water, and the mortuary body rack. The mechanical and sanitary services include steam and dual cold water supplies comprising brackish water for flushing and fire fighting and fresh water for all other purposes. There are three medical piped gas services, oxygen, nitrous oxide and vacuum lines. Electrical systems installed include a visual location system, a fire alarm system, slave clocks, a patient-to-nurse call indicator system, lifts, radio rediffusion and telephones.

2, north west side of the male medical block. 3, the main entrance from the west: kitchens in foreground, out-patients block beyond flagpoles. 4, the north ends of the two male ward blocks: surgical on left and medical on right.

## BOOKS

### ELYSIUM IN LITTLE

THE NEW SMALL GARDEN. By Lady Allen of Hurtwood, F.I.L.A., and Susan Jellicoe. The Architectural Press, London, 15s. net.

Circumstances beyond our control oblige the majority of us to be content today with a small garden or to seek a method of reducing to a minimum the labour of maintaining a larger one. Lady Allen and Susan Jellicoe's timely little book shows, with admirable clarity of text and well-chosen photographs and plans, how enterprising possessors of pocket-handkerchief gardens can achieve a lay-out of originality and distinction. There is something here for every taste, site and pocket: for the expert who wishes to grow rare and difficult plants; for the lover of a mere 'mass of colour'; for the business man who has interest and energy only to keep a lawn mown. There are gardens which even the wildest children could hardly damage. There are gardens to sit in, to walk in, to dream in. The difficulties of the long and narrow London garden have not been shirked, nor those of a plot so small as to seem hopeless. Who would guess from the photograph that Miss Vivienne Kernot's London garden (p. 52), for example, was no more than eighteen feet by fifteen—the size of a very ordinary sitting-room?

Not the least merit of this book is the extremely practical outlook of its authors. Materials necessary for paving, screening and the treatment of walls are carefully listed; and prices have not been considered too sordid to mention. Suitable shrubs and plants for various soils and outlooks are fully described. There is, further, an appendix, 'How to find out,' which names firms and societies which are ready to supply materials or give advice.

Perhaps the least successful gardens shown are those where sculpture has been introduced informally. In Lady Hendy's St. John's Wood garden (p. 19) the wooden female figure looks strangely ill at ease among the day-lilies, nor is a plaster horse's head from the Parthenon (p. 121) other than comic at ground level in a shrubbery. Sculpture in a garden would seem to demand formal treatment.

I can find only one real flaw in this delightful little volume. Gardens exist for twelve months in the year, and the small garden is all the more with us for being inevitably so close to the house. Now the authors show us photographs where summer ever reigns and skies are never clouded; where irises and peonies are in fullest flower; where tea is laid beneath the shade of clustering roses. But how do these gardens appear in December, in the rain? It is a problem that architects also notoriously shirk. None the less, I could wish that Lady Hurtwood and Susan Jellicoe had had the courage to give us one or two photographs at least, indicating the means by which some element of beauty can be retained in a small garden throughout

the long and gloomy English winter.

It is only natural that the town garden should, in a book of this kind, receive the fullest treatment. Country gardens, however, have also been included, together with a few examples from the Continent. With the exception of the austere Danish garden (p. 56), where granite cubes have been successfully placed in the grass to form an abstract pattern, the latter would not appear to indicate that the Continent has much to teach us. Had space permitted a fuller survey, including further examples from Germany and some also from America and Japan, we might perhaps have been persuaded that the problem of the small garden is capable of a yet wider range of solutions, not a few of which are suited to the English climate and in harmony with the English scene.

Wilfrid Blunt

### MEDIEVAL PELICAN

ARCHITECTURE IN BRITAIN: THE MIDDLE AGES. By Geoffrey Webb. Pelican History of Art, 52s.

The Pelican History of Art has been blamed by several critics for giving too much space to England. Mr. Webb's book is a vindication of the editor; for, unbelievable as it may seem, there existed, before it and Mr. Summerson's volume appeared, no scholarly history of English architecture in the English language, if one leaves out the four paper-bound pamphlets published in 1946-52 for the British Council by Longmans Green. They were written by Sir Alfred Clapham, Mr. Webb, Dr. Whinney and Mr. Summerson, were excellent throughout on their miniature scale and ought to be back in print. The volumes of the Pelican History of Art are of a different calibre. Mr. Webb's must be compared with Bond's books and is superior to them not only because it is up to date but also because its arrangement is historical and not by such categories as plan, vaults, walls, piers, windows, etc., as for instance Miss Evans's *Clunian Architecture* still is—no doubt on the French archaeological pattern.

For English medieval architecture, Mr. Webb had been preceded mainly by Clapham's outstanding volumes on Anglo-Saxon and Norman architecture, models of clear arrangement and sparing writing, and by Prior's *Gothic Art*, a splendidly written but no longer reliable book. Mr. Webb's is perhaps more in the line of his predecessor as Cambridge Slade professor than of his predecessor as secretary of the Royal Commission on Historical Monuments. It reads easily everywhere, it is full of personal observations, it is never pedantic, and it is occasionally just a little perverse. To disregard, for instance, the division of 1066 (or 1050, if Edward's Westminster Abbey is taken as the signature building) as a chapter division and replace it by 1093 (the start at Durham) is surely wilful, and it is equally wilful to treat secular buildings up to 1240, before any Gothic churches

are introduced. But Mr. Webb may well have done these things deliberately so as to lead his readers smoothly from chapter to chapter. Here also is the reason—and a good reason it is—for fitting chapters or pages on castles and houses between and into chapters on churches, instead of treating them separately at the end. Readers of THE ARCHITECTURAL REVIEW may have wished to see more than about 40 pages devoted to domestic buildings and to get a little on town-houses and farm-houses. But Mr. Webb would no doubt answer that he is an historian of architecture and not of building. No-one certainly can suspect him of being ignorant of such minor structures and their characters; for in the Royal Commission he has to deal with them more than anything else and sometimes *ad nauseam*.

On churches the book is invaluable. It is the first to draw a convincing line of development of the Gothic style in Britain. It fits the great deal of scattered evidence which we have into a picture that turns out to be at once rich and artistically impressive.

With Mr. Webb's book five out of the seven volumes of the Pelican History of Art dealing with Britain are out. So for the time being the balance of the series is unquestionably upset; for Mr. Webb's is the eleventh volume to appear. But that lack of balance is only temporary. It may well be due to the fact that the editor is in a better position to harass authors in England than abroad. Another temporary lack of balance—welcome to this journal—is the number of architectural volumes out or in hand. After Mr. Webb's, so the prospectus promises, the next volumes will be on Greek architecture (A. W. Lawrence), Romanesque architecture on the Continent (K. Conant), international nineteenth and twentieth century architecture (Henry-Russell Hitchcock) and Gothic architecture on the Continent (P. Frankl). Is the reason perhaps that architecture is a more practical art than painting and sculpture, and that therefore the architectural historian is a more practical and business-like man than the historian of painting and sculpture?

S. T. Scott

### EXILE & GOTHICK SECLUSION

THE CALIPH OF FONTHILL. By H. A. N. Brockman. Werner Laurie, 21s.

In *The Caliph of Fonthill* H. A. N. Brockman, himself an architect, gives an agreeably readable bird's-eye view of the life of William Beckford, the author of *Vathek* and the *Excursion to the Monasteries of Alcobaça and Batalha* with particular reference to the work of Wyatt, whom he employed to build his Abbey at Fonthill, and of Henry Goodridge, who designed him the Lansdowne Tower above Bath. Nikolaus Pevsner has written a foreword in which he makes clear the angle of the author's approach. Admirers of Beckford's writings might have wished for more detail regarding his life, such as his improbable

twenty-four years' membership of Parliament, and his dispute with the Rev. S. Henley, who, in 1786, published without authority his English version of *Vathek* which purported to be an anonymous translation from the Arabic, and so led, in 1787, to Beckford's publication of his French original. Mr. Brockman none the less gives a sympathetic and sufficient account of the personal background to make intelligible those aspects of Beckford's activities which he has more particularly set out to explore.

William Beckford, son of the famous Lord Mayor of London, was born at Fonthill in 1760 and educated by tutors. His father died when he was ten, leaving him a vast fortune; as he grew up he was taken travelling abroad and acquired a romantic love of nature. On his return scandal followed his association with a youth named Courtenay and Louisa, née Pitt Rivers, the wife of his cousin Peter Beckford. It was during this disordered period of his life that he wrote the oriental tale of *Vathek* in the French language.

In 1783, in his twenty-third year, he married Lady Margaret Gordon, who bore him two daughters. He seems to have lived most happily with her in Switzerland until her death in 1786. After his widowerhood he sought distraction by a journey to Portugal where he wrote the *Excursion* and was fired at Batalha with admiration of the 'rich cluster of abbatial buildings, buttresses and pinnacles and fretted spires towering in all their pride and marking the ground with deep shadows that appeared interminable so far and wide they stretched along.'

On his return he retired to Fonthill, where he planned and planted extensively to perfect the background of the Gothic Abbey which he commissioned Wyatt to build. In spite of Beckford's impatience, Wyatt's task took nearly twenty years to complete. The central feature, a tower of timber and stucco, collapsed in 1797 during its construction. Beckford is reputed to have said he was only sorry not to have been there to see it fall. The tower, which later replaced it, was cased with stone on a timber framing, and fell in 1825 after Beckford had sold Fonthill and moved to Bath. Wyatt's Clerk of the Works sent from his deathbed for Beckford, and confessed that he had failed to build into the foundations a relieving arch designed to spread the load. Beckford duly informed the new owner, a Mr. Farquhar, of the danger. When the second tower eventually collapsed in 1825, Beckford remarked that it had made an obeisance to Mr. Farquhar which it had never done to him. When Cyrus Redding told him that Farquhar had become so much attached to him that if he had lived longer he would have left the ruin back to him, Beckford remarked that he would have been in an ecstasy to see the proverb falsified, 'You can't eat your cake and have it too.'

After moving to Bath at the age of sixty-two and adapting a part of Lansdowne Crescent both for his habitation and for the housing of his remarkable collection of pictures and *objets d'art*, he commissioned Goodridge to build him a tower for the enjoyment of the view over the countryside, and in this elegant monument to the serenity of his old

age his bones were eventually laid.

There is much that is sympathetic in his curious life. The sight of Batalha seems to have prompted him to alter his original project of an ornamental ruin into the eventual plan of a full-sized abbey. Round his vast territory he flung a wall to exclude sportsmen and other intruders from disturbing the wild life that he loved and his flock of tame hares. He moulded the very landscape to his romantic conceptions with informal planting and a nine-mile ride through the solitude, on the lines recommended by Uvedale Price's *Essay on the Picturesque*.

He was a hermit who spent twenty years to perfect his own wilderness: a recluse who used up a fortune to make his own monastery. When fortune and walls had crumbled away, he seems to have found as he grew old an unexpected contentment at Bath, in his fondness for his surviving daughter, the Duchess of Hamilton, and his unfailing appreciation of the beauties of nature and art. Mr. Brockman, remembering one aspect of his life, the architectural, and all that went with it, concludes by paying tribute to his courage and his pride: as an admirer of the *Excursion* I would recall in particular the unequalled harmony he achieved between the grandeur of his sense of poetry and the gaiety of his sense of humour.

Bryan Guinness

## BUILT IN POLAND

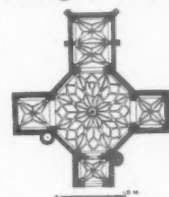
THE ARCHITECTURE OF POLAND. By Zbigniew Dmochowski. Polish Research Centre Ltd., London.

POLISH ARCHITECTURE UP TO THE MID-19TH CENTURY. By Jan Zachwatowicz Budownictwo i Architektura, Warsaw.

These two books have come out neck and neck from opposite sides of the Iron Curtain to cover the same ground. The Warsaw book is enormous—500 big good-quality photographs and not much text (it has been available in Polish for some years); the London book is smaller but contains more, packed out with good plans and rather bad photographs which I won't condemn for a moment because it looks sadly as though better illustrations were unobtainable through 'force of circumstances'; many buildings in the London book have plans and descriptions only. The two Polands are not even the same: the London book covers pre-1939 Poland and includes Vilno as well, while the Warsaw book deals with today's state with its Oder-Neisse line and its shorn Eastern frontiers.

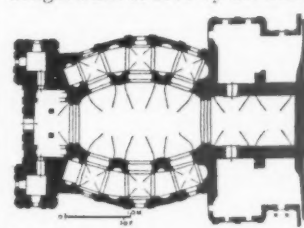
Yet in spite of all this the Polish-ness of Polish architecture shows through—muted to something like an official attitude in the Warsaw book, coming out in a firework of high spirits and gaiety in the London book, gaiety and swagger expressed even in the plans. On the evidence of these books the Poles have never invented their own style, have always performed brilliantly on the current styles around them. In the fifteenth century this meant Brandenburg brick Gothic purged of the Teutonic Knights' heaviness (Our Lady, Poznan, or Corpus Christi at Cracow); in the sixteenth century, the Sigismund chapel at Cracow (by Berecci, 1520) of

which Bramante need not have been ashamed, and town houses in bubbling Plateresque. Later it meant Louis-Quatorze without the academic straight-jacket, and Neo-Classicism with some life to it. Today, if nothing else, it means a sparkling re-creation of Neo-Classical Warsaw (the London book shows the pre-war state, the Warsaw book shows the rebuilt houses and public buildings. Tomorrow, as month by month 'Architektura' struggles away from cornices and the other trappings common to City of Moscow communism and City of London capitalism, it could be the means of transmuting the doughy modernism of Western Germany. I'd like to give two more examples: first, several late Gothic churches were built in Bohemia that were 'hall churches inside out,' i.e., two naves joined together by a single central arcade. Who but the Poles would have reduced this to one single pier in the middle of the church as though it were a chapter house, and then—



Goslawice

at Goslawice—used this idea as the octagonal centre of a Greek cross, with single bay porch and 'transepts' and a two-bay chancel? And, second, where else would you find the Austrian baroque oval church plan adapted first into an elongated octagon, and then given 'aisles' made up of three chapels and trapezoidal spaces joining them, covered with lean-to roofs? 'The composition thus resembles a basilica, especially since the nave is covered by a barrel vault with lunette windows, skilfully adapted to the octagonal plan. . . . This is (was?) at Tarnopol, designed about 1775 by the amateur Augustus

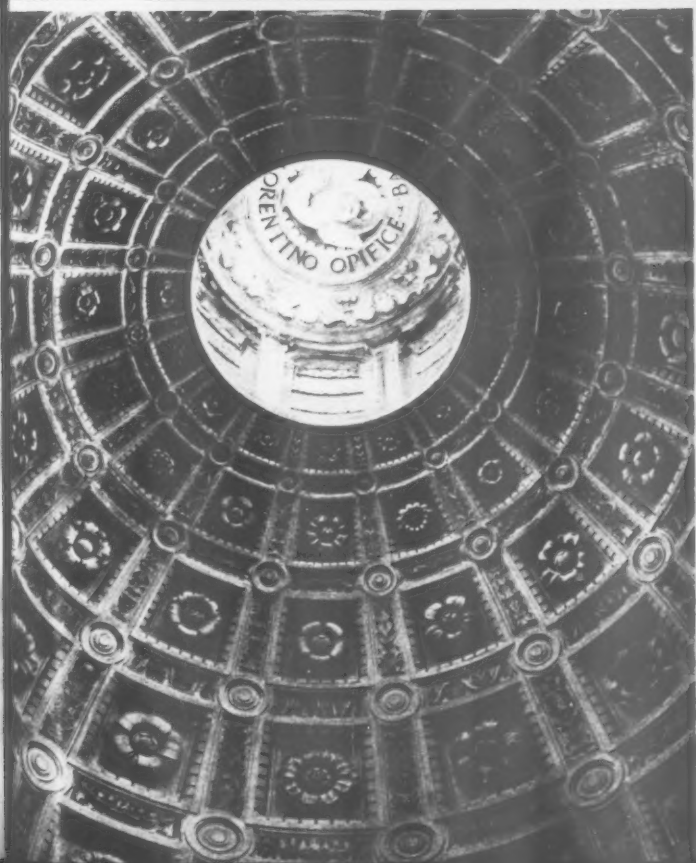
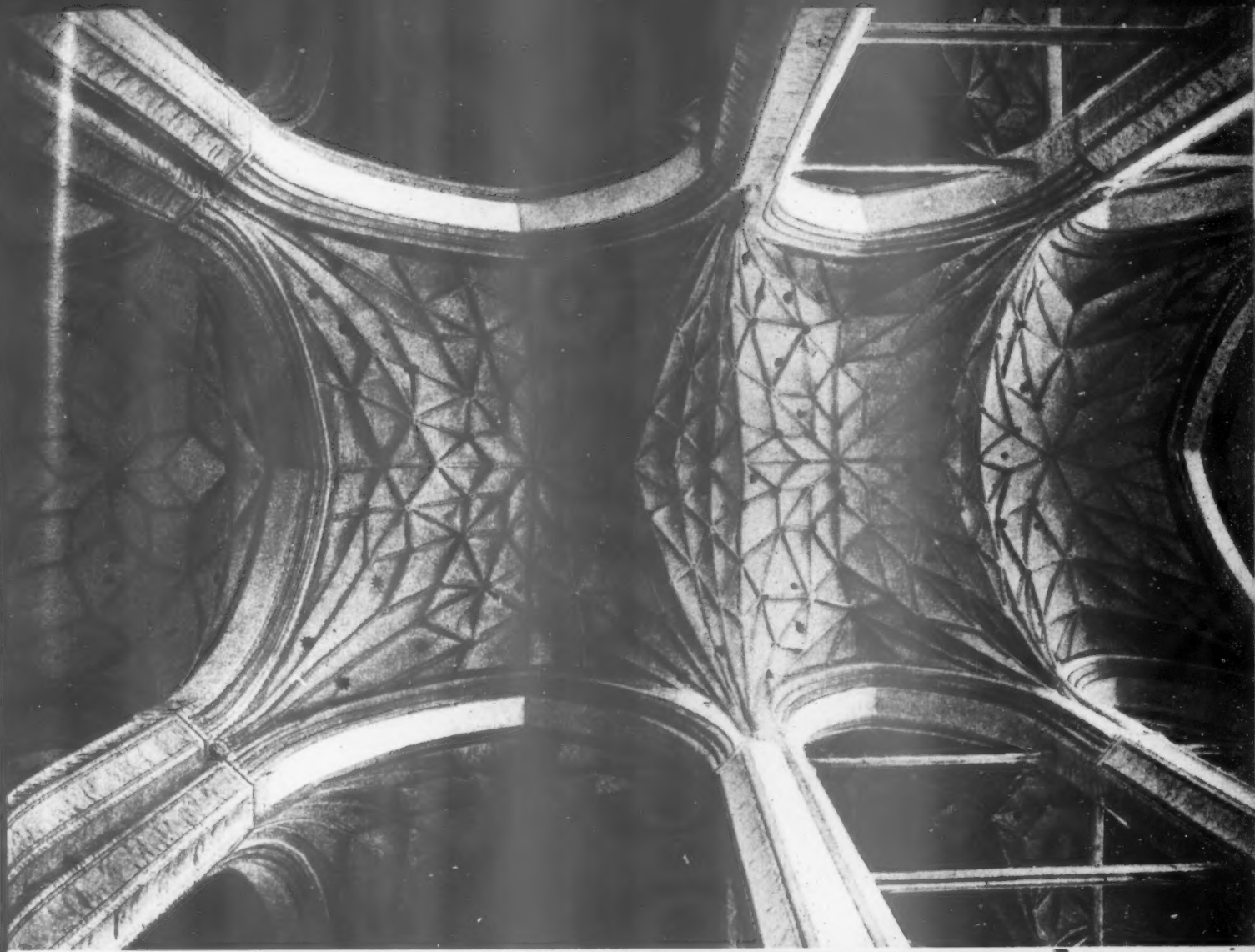


Tarnopol loaded with overtones of the last twenty years. It is really present-day Poland that is uncovered in these two books.

If you are interested, do three things. Look at the Warsaw book in the R.I.B.A. library; buy the London book for its double record of indomitable human spirit, both in the buildings themselves and in the way it was compiled—largely from pre-war material made up by the students at the famous Polish School attached to Liverpool University. And then apply for a visa to try and see the buildings for yourself. For if ever there was a situation to which Auden's too-often quoted line applies ('we must love one another or die') this is it.

Ian Nairn

**built in Poland:** two examples of the Polish temperament. Top, the star vaults of the transept of the Sondergothik church of St. Mary, Danzig. Bottom left, the Bramantesque vault of the Sigismund chapel dome, Cracow, built c. 1525 by the Italian Berecci, and bottom right, this Renaissance style translated into Polish terms: the dome of a chapel in Uchanie church, c. 1625.



## FUNCTIONAL TRADITION

### SKYSCRAPER SHEDS

*The functional tradition is not incapable of combining on occasion an element of fantasy with the bare geometry that comes from the directness of its response to the challenge*

*of function and materials; witness these fishermen's storehouses on the beach at Hastings, below, with their echoes of San Gimignano and the New York waterfront. Built to contain nets and other fishing gear, they are all of timber, tarred from top to bottom, and windowless. Note the casual arrangement of the doors and small hinged openings that have been inserted as needed. Similar sheds are to be seen at Rye Harbour, Sussex.*

J.M.R.



## EXHIBITIONS

### PAINTING

*By exhibiting paintings 'in glorious monochrome' by the Parisian artist Yves Klein, Gallery One, in D'Arblay Street, has given the public the opportunity of seeing the kind of modern art which has every appearance of confirming—as Alan Bowness of The Observer remarked—'its deep-seated suspicion that the whole thing is a gigantic leg-pull.'* The introduction by Pierre Resnay was appropriate to the occasion: faced with the task of expounding the virtues of a number of rectangular boards covered by a single colour applied with a roller, and knowing that, whatever he wrote, the public would be bound to associate these works with a paint manufacturer's display samples, he made gigantic claims for them in sensitively nonsensical terms.

The main room displayed a wide range of colours and sizes which gave me the impression that the Gallery was specializing in the sale of natty notice boards, and incidentally supported Resnay's contention that Klein 'cannot be suspected of any attempt at mural decoration.' But in the small back room something evidently went wrong, for it was devoted to an ensemble of six dark blue boards which brought out their possibilities as mural decoration. They were identical in size and uniform in hue; they were hung round the room at the same height and at regular intervals—and the effect was quite remarkably refined, austere and mysterious. Klein hit on a particularly resonant blue for these panels, and aided by the magic of multiplication, transformed a rather dingy little interior into a rough draft for a three-dimensional poem about silence, serenity and a night without stars. They do not have much to do with the art of painting, and I think that the sophisticated amateur who adds a single example to his collection is making a mistake, but I also think that if an imaginative architect could get Klein to work with him, the collaboration might have some exhilarating results.

The extremely well-chosen pictures which, together with a smaller group of sculptures, comprised the 'Post Picasso Paris' exhibition at the Hanover Gallery, brought together some strikingly different aspects of free abstraction. The painters of these pictures would almost certainly endorse Resnay's assertion that the eye is 'terribly contaminated by the external

ject,' and in the circumstances it was perhaps unfortunate that the only picture which showed signs of being tainted by the outward gaze—de Staël's 'Paysage du Midi'—was the finest in the exhibition. Bissière, Bazaine and Manessier are the craftsmen of the movement, and their colour patterns, which were organized with passionless skill and sedate good taste, looked stilted beside the more zestful and explosive abstracts of Riopelle, but even the Riopelles looked distinctly cool and collected beside the works which represented what Lawrence Alloway calls 'the search for images powerful enough to survive the turbulence of the handling.' Appel, who is one of the leaders of this branch of the mystique of turbulence, contributed a giant head with a fine splash of moustache where the mouth would be if his vision were contaminated by the external object. The painters of this kind like to think of themselves as 'organisms' rather than human beings, and they adumbrate images which, at their best, have the look of being beneficial expulsions, as if they were doing for some other part of the organism what the voiding of wind does for the stomach. The composition by Thanos Tsingos, 1, is, I think



a good example of the painterly eruption. Its raging vegetation is poured straight from the tube, and has the hot and glutinous look which we have come to expect of these specimens from the visceral jungle.

Ceri Richards belongs to that small band of English figure painters—William Scott is another—who are up-to-date and highly accomplished in their handling of paint, but maintain a solemn and old fashioned belief in the necessity of 'distortion,' and feel themselves to be supported



in their conviction by the farcical figuration of Dubuffet. In the paintings of reclining figures, 2, which composed the greater part of Richards's recent show at the Redfern, his colour and his handling of paint were more exquisite than ever, but the figures, rendered as swellings with flapping appendages, seemed to me to be misconceived: although capably drawn, they were unpleasant as nudes, unamusing as figures of farce, unconvincing as 'presences' and uninteresting as forms.

Probably the only way in which contemporary painters are likely to be able to overcome their horror of treating human figures naturally is to put them into human situations. The strength of the Australian painter Sidney Nolan lies in the fact that he has—or had—something to say about people in their environment; it made his Retrospective at the Whitechapel Art Gallery one of the most interesting exhibitions held in London since the war.

His exhibition only covered the ten years from 1947 to the present day, but it started at the moment when the naïve style which had given his first Ned Kelly series something of the comic vigour of the Mack Sennett two-reelers, ceased to be a borrowed idiom and became an intensely personal and entirely adequate means of capturing the apparitional look of lonely men in an empty land. The finest pictures of this period, such as the painting of an escaped convict, in which the broad horizontal bars of the prison garb become, in the heat haze of the desert, a kind of crazily conspicuous camouflage, lose nothing by being hung beside the technically



more assured and splendidly imaginative works which followed—the studies of the awe-inspiring landscapes of Central Australia, the spectral 'Drought' series and the second group of paintings devoted to the exploits of Ned Kelly and his band of bushrangers. The masterly 'Death of Constable Scanlon,' 3, painted in 1955, is in some ways a reconsideration of the naïve style of the earlier series. The 'Head,' 4, painted this year, contains reminiscences of his treatment of the bushrangers, and for virtuosity of colour and brushwork was



the most remarkable picture in the exhibition, but it disclosed more interest in the paintings of Appel than in the human situation, and I reckon this to be a serious loss.

Another Australian painter, Albert Tucker, included in his recent show at the Imperial Institute a group of paintings on the Ned Kelly theme which he himself says 'started with the impulse to parody Nolan.' But the idea of treating the Kellys as bogeymen has its own kind of authenticity, and the painting by Tucker called 'King Kelly and his Legions,' 5, turns the



fear-engendered legend of the band's immunity to the bullets of the police into a credible imagery. Nolan's richer and

more human account of the Kellys has enabled Tucker to make an interesting contribution to surrealism.

The liveliest twentieth-century parallels to the sixteenth- and seventeenth-century Arcimboldeque paintings shown at the Arthur Jeffress gallery are to be found in collages of the kind which John McHale designed as a cover personage for the May issue of AR. The early sixteenth-century example reproduced here, 6, a conceit on the



dissolution of the flesh; is not 'true' Arcimboldeque because the head is simply an infested tree root instead of being composed of a number of separate objects, but the fact that, like so many works by Nash, Sutherland and Moore, it can be correctly described as a 'found object interpreted' suggests that the critics were perhaps a little hasty in writing off the exhibition as a frivolity.

Robert Melville

## COUNTER-ATTACK

[The monthly list of some of the cases of bad and good planning under investigation by the Counter-Attack bureau.]

**26. Warwick—also Barford, Tiddington and Atherstone—(County Planning Office and local Councils):** There used to be an unspoilt approach to Warwick Castle from the east—until bad planning got there. This is the view now, 1, with the castle arrowed. This ribbon is in the Development Plan, which has not yet even been approved. What is also shown in the Development Plan is an even worse ribbon on the south approach to Warwick along the left-hand side of the road shown in 2. This is a mockery of good planning by any definition—there is just one house along this stretch, and that looks thirty years old, and is embowered in trees. It is not too late for the Minister to strike this out of the County Plan, and we sincerely hope that he will do so. This county seems to specialize in these inchoate roadside heaps of 'superior' residences—here is another, at Barford, 3. It is a sad reflection on



what is reputed to be a cultured profession that most of these houses must have been designed by architects.

Other things in this Development Plan include an absurd satellite to Stratford-on-Avon (a town with only 15,000 people) created by exploding the village of Tiddington, which is, alas, inside the UDC boundary: the damage is now done, 4; and housing for Atherstone which will be on the wrong side of the proposed Watling Street bypass: again an odd bit of planning by any standard.

**27. Bingham's Melcombe, Dorset (County Planning Office):** The fight to prevent pylons breaking up a unique village group has now been won. The owner of Bingham's Melcombe opposed the County Planning Authority, and was supported by the REVIEW (August 1956); the Ministry has now allowed his appeal. This is a welcome victory for the principle of specific solutions for specific sites, instead of unthinking application of a rule of thumb—in this case the rule of No Pylons On Skylines.

**28. Jodrell Bank, Cheshire (Manchester University):** The new radio telescope (see also page 153) is an object lesson in fitting something huge and startling into a rural landscape. It is mercifully free from architecture—the whole lot might have been brickclad instead—and it is sited in the middle of the Cheshire plain where there are so many big trees that it can rarely be seen from more than a couple of miles away; even close to, it plays hide-and-seek with foliage like a Picturesque folly, 5. A national landscape plan could take note that the Cheshire plain, like the Fens, can absorb interruptions like this; but until there is such an overall plan we will continue with our present proportion of one happy accident to ninety-



nine hideous mis-couplings of countryside and technology.

**29. S O S: Plymouth, Devon (City Council):** Most of England's blitzed cities have tried to preserve what remained of their old centres in rebuilding: apparently not Plymouth. The fate of the Barbican (AR, April 1957) is still in doubt; here is another threatened corner at one end of New George Street, 6; it is to be destroyed in order to extend the avenue. Something which in its quiet way is a model of urbanity will be replaced by 7—taken from the same spot by turning the camera through 180°: a model of reactionary sterility.



**30. S O S: St. Catherine Cree, London (Diocesan Advisory Committee):** This church, the best in England of its period (1630) is actually being considered for demolition by the Diocesan Committee—an act of folly which rivals the proposals made for pulling down St. Mary Woolnoth after the First World War. This must not happen—it is incredible that any civilized body of men, however hard up, should have thought of it: the address of the Committee is 33, Bedford Square, W.C.1.

# SKILL

A MONTHLY REVIEW

OF BUILDING TECHNIQUES & INDUSTRIAL DESIGN

1 interiors

2 design-review

3 techniques

4 the industry



1, S.S.  
'Theodor Herzl.'

## 1 INTERIORS

Four ships whose interiors are illustrated below, extend the range of precepts of nautical

and anti-nautical design given in the ARCHITECTURAL REVIEW for February, 1956, and while they signal the entry of Israel into the select register of leaders of nautical styling, they emphasize again the degree to which British ships still lag behind, in spite of the fact that interior design is rapidly becoming a competitive margin in the passenger trade.

### S.S. 'ISRAEL' AND S.S. 'THEODOR HERZL'

Architects: Dora and Yeheskiel Gad; Al Mansfeld and Munio Weinraub

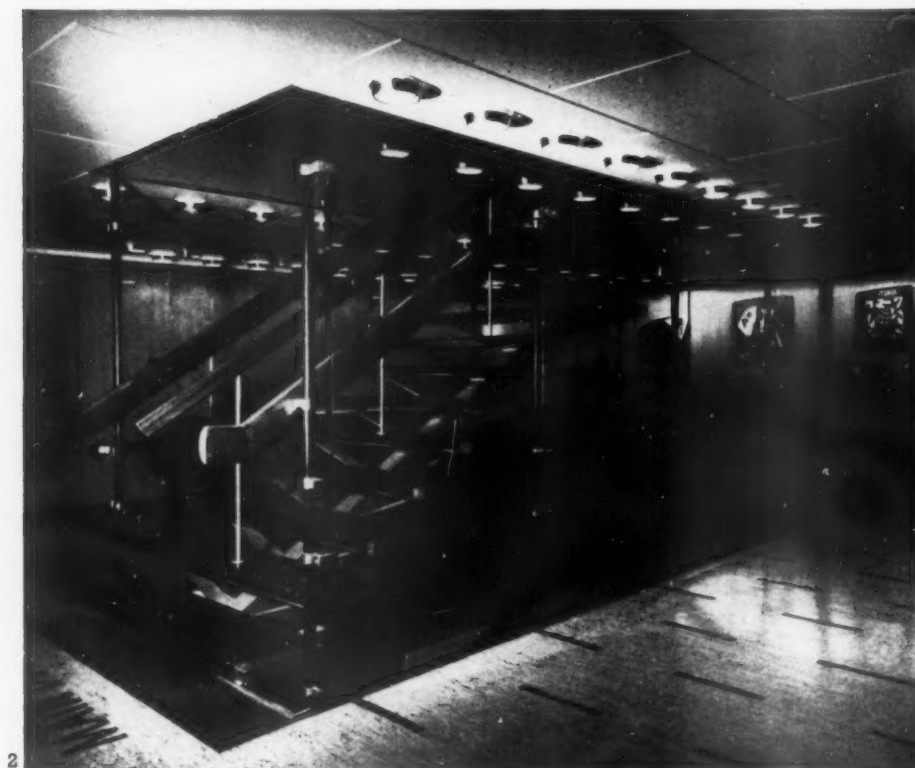
The S.S. 'Israel' and 'Zion' are sister ships of 10,000 tons carrying 313 passengers, together with cargo; they were built by Deutsche Werft of Hamburg out of war reparation funds.

The shipping line only decided on employing architects for the interior design after the contractors had produced an old-fashioned oriental pastiche, and a team of Israeli architects was only chosen after Italian and Scandinavian names had been considered. The architects had no previous experience of marine architecture, but they looked on this as an advantage. They replaced the conventional three-armed staircase in the contractors' plan by free-standing ladders, which gave greatly increased space to the public rooms. Unframed glass doors and sliding doors were also a departure from custom. Both the owners and the architects wanted sufficient comfort for the ships to compete with the

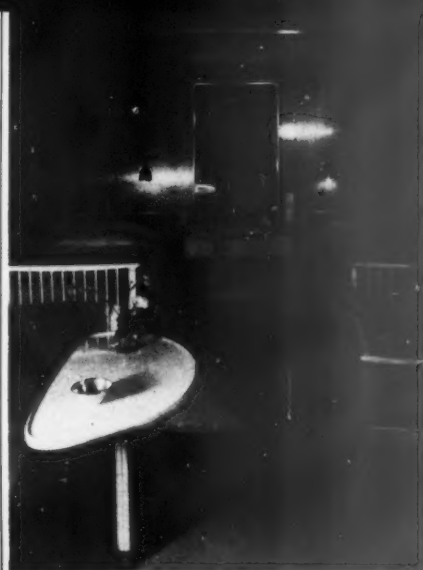
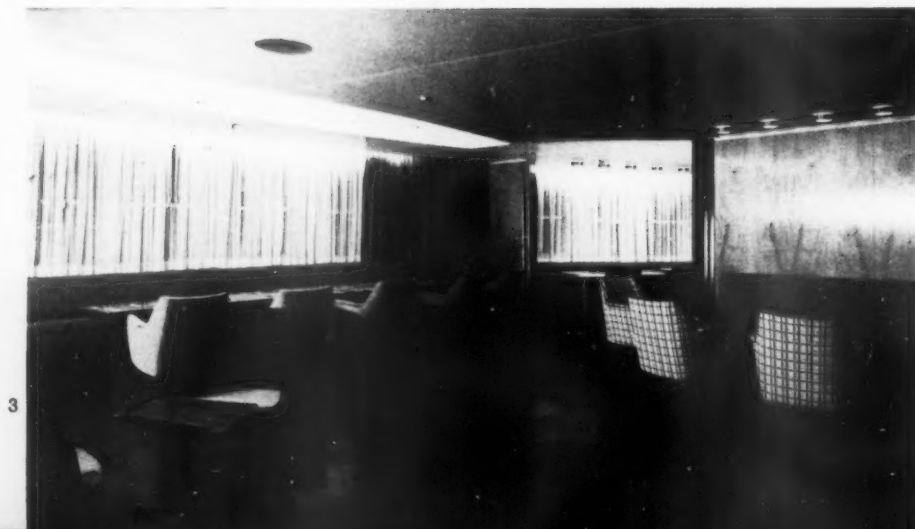
big shipping lines, while avoiding the plushy. Loose furniture of lighter construction than is customary was made possible by improved stabilizing gear. They also wanted a Mediterranean atmosphere; to this end, light woods and Palestinian materials like bamboo and rattan were used for decorations and finishes. Loose furniture and lamps were all bought in Israel, though certain fabrics were obtained from Denmark. The maiden voyage of the 'Israel' was in February, 1956.

Above all, the architects wanted passengers to feel they were in a ship, not in a poor imitation of the Waldorf Astoria. Hence the essential nautical character in the interiors has not been disguised.

# **S.S. 'ISRAEL'**



2, the first-class hall on the main deck: an example of the highly compact stairways in the passenger areas of these ships, which break away from a strong non-utilitarian tradition in passenger liners. The carved wood panels on the back wall are by Perli Pelzig. 3, the smoking room of the first-class lounge, on the promenade deck.



4, a two-passenger first-class cabin on the boat deck. 5, the tourist lounge on the promenade deck; the woven mural was designed by Jean



David. 6, looking from the writing room into the smoking room, in the first-class lounge.



S.S. 'THEODOR HERZL'



7

7, one of the forty-seven first-class staterooms, in all of which the beds are in a recess designed to be curtained off in the daytime, turning the rest of the cabin into a sitting-

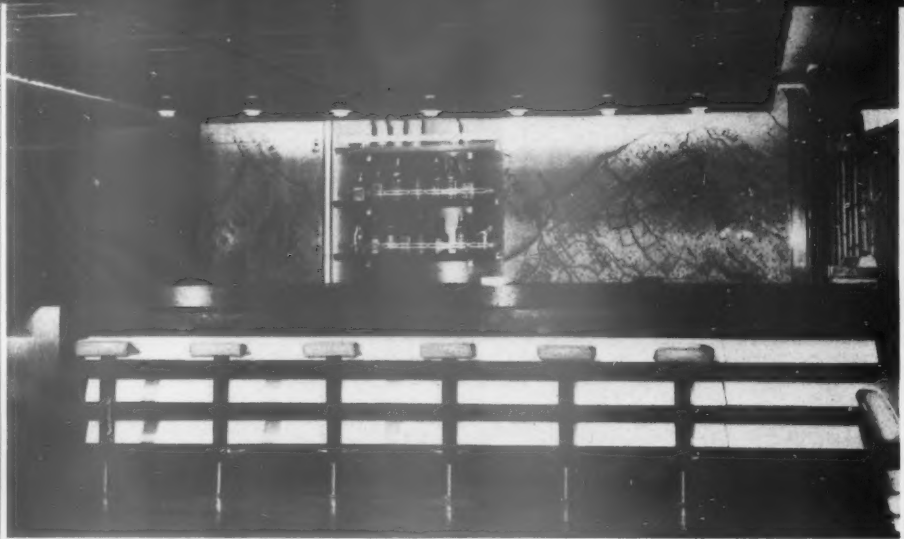


8

room. 8, the tourist lounge with a mural of melamine plastic panels designed by Naphthali Bevev. 9, the first-class lounge.



9



10

10, the bar in the 'Haifa hall' (a large lounge); the photostat map behind the bar is of Haifa Bay. 11, the dining-room for both classes, with curtains designed by Dora Gadi.



11

The 'Theodor Herzl' and its sister ship the 'Jerusalem' are of 10,000 tons, and carry 540 passengers. Practically no differentiation in the standard of comfort is made between the tourist and first classes, one dining room serving both. More emphasis than in the 'Israel' is given to murals, sculptures, etc., by Israeli artists, generally with a national theme such as 'regeneration' or 'promise and fulfilment.' In the writing room is a permanent exhibition commemorating Herzl, a journalist who was one of the spiritual founders of the modern Jewish state. The maiden voyage of the 'Theodor Herzl' was on May 7th this year.

Overleaf comparison is offered with two other new liners.





12

## R.M.S. 'SYLVANIA'

Left, r.m.s. 'Sylvania,' a new 22,000 ton Cunarder which made its maiden voyage in June this year, and whose décor, in the words of the Cunard Line itself, reflects 'something of the genius of the eighteenth century, is, in fact, a pastiche of several famous styles.' 12, the first-class smoking room, decorated with regimental badges and motifs of pips, crowns and chevrons. 13, the first-class lounge, 'modelled on the boudoir of Madame de Serilly.' The comparison with the Swedish 'Gripsholm,' 14, 15, also completed this year, emphasises that British Lines are now almost alone in insisting on unshiplike period-style interiors.



14



13

## S.S. 'GRIPSHOLM'



15

# TECHNIQUES

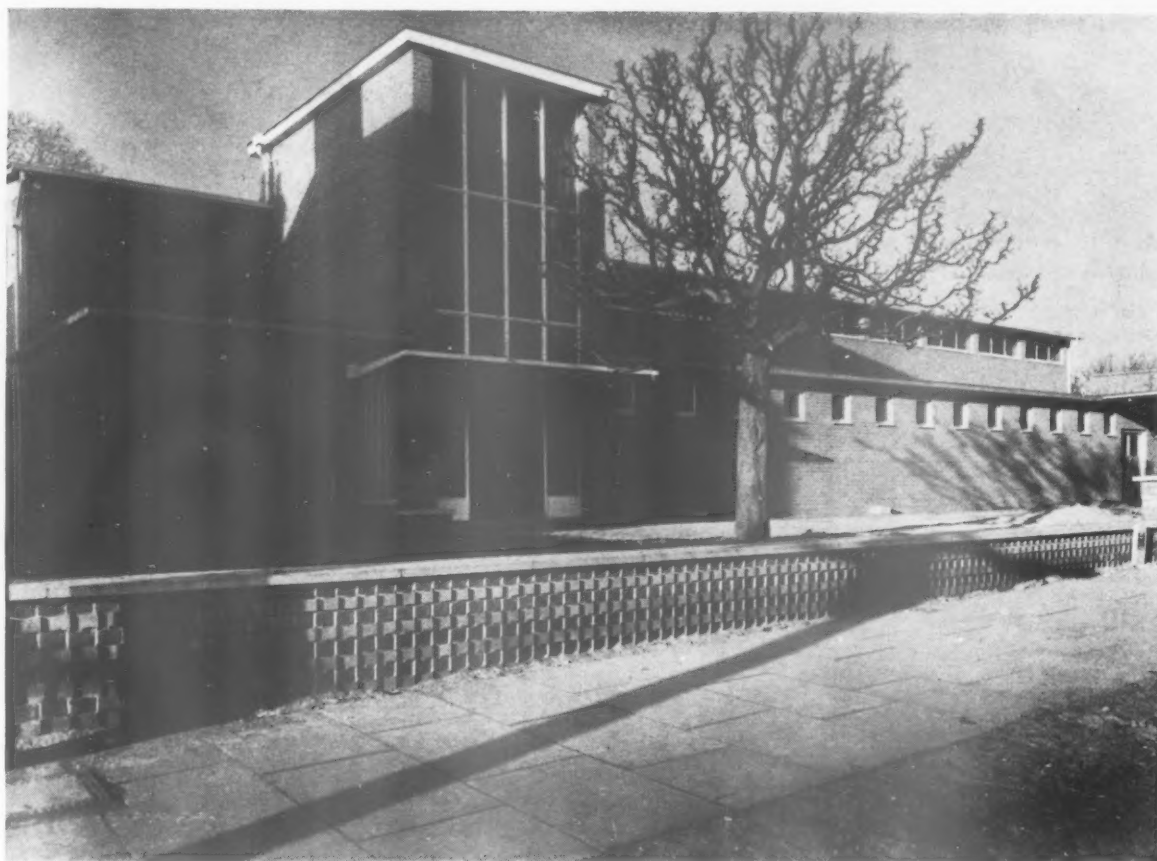
Alongside of the manufacture of the curtain wall framings discussed earlier in this issue is another sub-industry, concerned in the manufacture of panel infillings. This month, therefore, we give pride of place in Skill to a tabular review of the standard infilling panels which are now (or which were, at the time of going to press) on the market in Great Britain. Whilst every effort has been made to provide a complete survey, development is so fast in this field that there may well be some omissions.

walls off the peg

## PANEL INFILLINGS

Table  
analysing  
properties of  
proprietary  
panels  
(part I)

name of panel	maker or supplier	description	finish and colour	thickness	max. panel size	lbs. per sq. ft.	'U' value	fire resistance
MUROGLASS	Pilkington	rough cast glass with a permanent colour fused to the interior surface	red, green, grey, yellow, pale blue or deep blue (further colours to be added)	$\frac{1}{4}$ in.	4 ft. by 8 ft.	3.37	1.0	—
VITROSLAB	Plyglass	laminated panel consisting of a sheet of glass backed by a veneer of flat glass fabric, a sealed cavity and a backing of glass or glass and an insulating material	colours to BS, BCC, Archrome, Munsell. Finish to glass plain, hammered, stippled, reeded, dotted, striped or rough cast	$\frac{5}{8}$ in. to $2\frac{1}{4}$ in.	4 ft. by 8 ft. (possibly up to 10 ft. depending on constitution of panel)	3.0 to 11.5	0.6 to 0.13	up to 2 hrs., depends on type



## In Contrasting Colours....

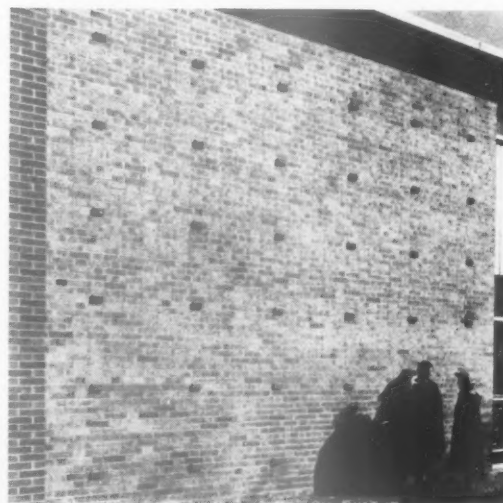
**of Ibstock Dusted Purple and  
Buff-Multi Rustic Facing Bricks**

BEDFORD COLLEGE OF PHYSICAL EDUCATION  
NEW GYMNASIUM, Warwick Avenue, Bedford.

*Architect: Under the direction of the Bedfordshire  
County Architect, S. Vincent Goodman, F.R.I.B.A.  
Contractors: Lindum (Lincoln) Ltd.*

PLANNED in accordance with modern conceptions of the teaching of movement, this building holds to traditional values of good brickwork for exterior grace. Some of its attraction can be attributed to the use of contrasting colours in the same texture brick -- and both are Ibstock facings.

# Ibstock



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London: L.M.R. Goods Depot, Wrights Lane, Kensington, W.8 . . . . . Phone: Western 1281 (2 lines)

*'Summerhill', the home of Dr. Macdonald at Stanley, in beautiful Perthshire, was built in 1895 by the Earl of Warwick for his son, the Hon. Louis Greville. Today it uses an up-to-date oil-fired central heating system, with fuel supplied by Shell-Mex and B.P. Ltd.*



## Modern heating in a Scottish Home suits an American wife



'In July 1954', writes American-born Mrs. Macdonald, 'we came over here from the United States to live permanently (a Scottish husband, who had lived over twenty years in America and an American wife, who had visited Scotland once). Nearly all our Scottish friends advised me strongly not to come and talk about the terrible Scottish winters, etc. Well, we are here and we are perfectly comfortable and for just one important reason; we have central heat, with an automatic oil burner, just as we had at home. I am afraid I am rather rabid on the subject of the lack of central heating in this northern country, which certainly needs it if any country does. So with us it boils down to the fact that if it were not for our oil heat, we should be completely miserable and probably leave Scotland entirely. This is quite a large house and it has kept most comfortably warm. Of course, we do not keep it all at 70° as Americans do, but have the hall thermostat set at 62° which people here find very adequate—and some rooms are warmer than that.'

BETWEEN DUNSINANE CASTLE AND BIRNAM WOODS—renowned for their association with Macbeth—stands this lovely house, the home of Dr. Macdonald. Among its previous occupants have been the Hon. Louis Greville, the Marquis of Zetland, the Duke of Portland, the Countess of Warwick and General Barber.

Dr. Macdonald had lived for over twenty years in America before he came to settle permanently in his native Scotland. His American wife tells how strongly their Scottish friends advised her against making their home in Scotland, owing to the weather and the 'terrible Scottish winters'. But their modern, automatic, oil-fired heating system gives them all the comfort they want; without it they 'would have been completely miserable'.

Comfort, cleanliness and convenience are the hallmark of oil-fired heating; and house-owners are finding that oil fuel, bought in bulk, is surprisingly economical. It is suitable for blocks of flats and public buildings and, increasingly, it is being installed in houses of every type and size.

From hot water supply in the smaller home to full central heating in larger buildings there are now available special oil-fired units designed for every requirement. Two kinds of oil are supplied for heating—Shell Domestic Fuel Oil for the larger installation and BP Domesticol, the new fuel specially developed for the smaller boilers with vaporising burners.

If you are designing or modifying almost any kind of building, public or private, you may well find it worth your while to make provision for this modern, convenient heating method. If you would like to know more about oil-fired heating you should write for a free copy of 'Oil Fuel at Home' to Shell-Mex and B.P. Ltd., Fuel Oil Dept. D4J, Shell-Mex House, Strand, London, W.C.2.

## PANEL INFILLINGS

Table analysing properties of proprietary panels (continued from page 212)

name of panel	maker or supplier	description	finish and colour	thickness	max. panel size	lbs. per sq. ft.	'U' value	fire resistance
HILLSULATE	Hills (West Bromwich)	1. Georgian wired cast glass, $\frac{1}{4}$ in. air space, back panel of aluminium alloy with inside face covered with resin based stove enamel paint	any colour	$\frac{3}{4}$ in. ( $\frac{1}{2}$ in. at perimeter)	6 ft. 8 in. by 3 ft. 4 in.	4.5 to 5.0	0.55	low
		2. Plywood core between 2 sheets of aluminium. External face covered with resin based stove enamel paint	any colour	$\frac{1}{2}$ in. preferable	4 ft. by 6 ft.	—	—	—
Q PANEL	Robertson Thain	an outer box ribbed section in aluminium or 'Gibbestos' protected metal (GPM) and an inner tray of metal coated steel, glass fibre insulation between	GPM either black or maroon	$2\frac{1}{2}$ in. or 3 in.	2 ft. by 10 ft. also 2 ft. by 12 ft.	3.0	0.18	—
3DF2 PANEL	Durasteel	two light gauge metal sheets keyed to a compressed asbestos composition core	galvanised and chlorinated rubber paint if conditions severe. (Copper or aluminium sheets can be supplied)	$\frac{1}{2}$ in., $\frac{1}{4}$ in. or $\frac{3}{8}$ in.	2 ft. $5\frac{1}{2}$ in. by 5 ft. $11\frac{1}{2}$ in. or 2 ft. $5\frac{1}{2}$ in. by 7 ft. $11\frac{1}{2}$ in. (special sizes up to 2 ft. $11\frac{1}{2}$ in. wide)	$2\frac{1}{2}$ 4.5 6.0	0.69	$\frac{3}{8}$ in. 2 hrs. (FOC)

## PANEL INFILLINGS

Table analysing properties of proprietary panels (continued from page 213)

name of panel	maker or supplier	description	finish and colour	thickness	max. panel size	lbs. per sq. ft.	'U' value	fire resistance
ESCOL	Stewart & Gray	(5 types of panel made, only type 'C' illustrated.) 16G porcelain enamelled steel face laminated to phenolic resin impregnated paper honeycomb, 20G galvanised steel back. Paper honeycomb filled with granulated vermiculite (back sheet may be enamelled steel plate)	any colour with variety of textures, e.g. granite or stipples in full gloss, semi-matt or full matt	$\frac{1}{2}$ in. 1 in. $1\frac{1}{4}$ ins. $1\frac{1}{2}$ ins.	7 ft. by 4 ft. (preferable max. 3 ft. by 6 ft.)	4.0 4.1 4.2 4.4	0.3 0.28 0.24 0.20	—
STRAMIT	Stramit Boards	compressed straw lined internally with kraft paper and externally with aluminium veneer	embossed aluminium	2 ins. +	4 ft. by 8 ft., 9 ft., 10 ft. or 12 ft.	4.1	0.3	1 hour +
ASBESTOLUX	Cape Building Products	an asbestos composition board which can be used as a single skin or as a composite panel	—	$\frac{1}{4}$ in. $\frac{1}{2}$ in. $\frac{3}{4}$ in.	2 ft. or 4 ft. by 8 ft., 9 ft. or 10 ft.	0.9 for $\frac{1}{4}$ in.	0.8	min. 2 hrs.
		a. 24G silicon alloy aluminium to special veneering grade Asbestolux	dark grey stereo embossed	$\frac{1}{4}$ in. $\frac{1}{2}$ in.	4 ft. by 6 ft., 3 ft. 6 in. by 4 ft.	2.0	—	min. 2 hrs.
		b. 16G vitreous enamelled sheet steel on special veneering grade Asbestolux	wide range of colours	$\frac{1}{4}$ in. $\frac{1}{2}$ in.	4 ft. by 4 ft., 3 ft. 6 in. by 4 ft.	6.0	—	min. 2 hrs.
	Mineralite	c. Special surface rendering of Mineralite on standard Asbestolux (timber battens behind larger panels)	any colour	$\frac{1}{8}$ in. + battens $1\frac{1}{4}$ ins.	4 ft. by 10 ft.	5.5	0.60	min. 2 hrs.

## PANEL INFILLINGS

Table analysing properties of proprietary panels (continued from page 214)

name of panel	maker or supplier	description	finish and colour	thickness	max. panel size	lbs. per sq. ft.	'U' value	fire resistance
ASBESTOLUX —continued	Joseph Freeman	d. 3 coat finish of Cementone No. 9 on standard Asbestolux. (Damp barrier to be fixed or painted on behind panel)	various pastel shades and dark grey	—	4 ft. by 10 ft.	—	0.8	min. 2 hrs.
	Deeraspray	e. Deeraspray mineral chippings on standard Asbestolux	—	—	4 ft. by 10 ft.	—	—	—
	Stewart & Gray Vitreous Enamelling Works Rustless Iron	f. 18G steel tray with vitreous enamel finish back and front, filled with 1 in. Rocksil and backed with Asbestolux on a vapour barrier	any colour, marble effects, some cases egg-shell and roughened surface in addition to normal gloss	1½ ins.	4 ft. by 6 ft.	approx. 6.0	0.2	—
	Cape Building Products	g. External skin of Asbestolux with finish as a to e, damp barrier behind, 1 in. Rocksil, vapour barrier, internal skin of Asbestolux	see a to e if required	—	see a to e	—	—	—
	Laconite	h. Outer skin of stove enamelled Asbestolux, core of steam baked cork, inner skin of Asbestolux	wide range of colours	1½ ins.	—	—	—	—
		In Vitroslab panel; see notes on Vitroslab						

## PANEL INFILLINGS

Table analysing properties of proprietary panels (continued from page 215)

name of panel	maker or supplier	description	finish and colour	thickness	max. panel size	lbs. per sq. ft.	'U' value	fire resistance
ETERNIT	G. R. Speaker	steam cured compressed asbestos-cement sheets						
		Granité	hard polished surface in reds, yellows, greens, blues, greys, etc.	$\frac{5}{8}$ in.	3 ft. 11 $\frac{1}{2}$ in. by 8 ft. 2 $\frac{1}{2}$ in.	2.3 approx.	—	non-combustible
		I.C.C.	hard polished surface in red, green, yellow, silver grey, blue-black	$\frac{3}{8}$ in. to $\frac{7}{8}$ in.	4 ft. by 8 ft. 3 in.	4.5 to 9.0	—	non-combustible
		composite panels made up with Granité or I.C.C. external face, cork or Eternit, Pical insulacore and a backing of Granité, I.C.C. or wallboard	see above	up to 2 $\frac{1}{2}$ ins. approx.	18 ft. by 18 ft.	4.0 to 10.0	0.14 to 0.54	non-combustible
PERMAPLY	Venesta	plywood impregnated under pressure with phenolic resin	sapeleormakore, (with clear lacquer or varnish if required)	$\frac{5}{8}$ in. to 1 in.	8 ft. by 4 ft.	0.7 to 3.5	0.9	nil
HOLOPLAST and DECORPLAST	Holoplast	a cellular panel manufactured from wood filled synthetic resin	HOLOPLAST: chocolate brown, terra-cotta, mid brunswick green	1 in. or 1 $\frac{1}{2}$ ins.	8 ft. by 4 ft.	2.0	0.49	Class II low flame spread
		1. panel with voids left unfilled	DECORPLAST: blue, buff, grey, red, green and yellow in 5 patterns with either satin or egg-shell finish	—	—	2.3	0.47	
		2. panel with voids filled with Rocksil or Fibreglass	as above	1 in. to 1 $\frac{1}{2}$ ins.	8 ft. by 4 ft.	2.5 to 3.3	0.34 to 0.25	Class II low flame spread

[continued on page 218]



EDINBURGH  
WEAVERS

102  
MOUNT ST  
LONDON  
W 1

## PANEL INFILLINGS

Table analysing properties of proprietary panels (continued from page 216)

name of panel	maker or supplier	description	finish and colour	thick- ness	max. panel size	lbs. per sq. ft.	'U' value	fire resist- ance
STONECLAD	Matthews Refractories	outer skin 16G steel sheet to which stone chippings have been fused by a refractory process. Inner skin an 18G steel sheet with a similar process, but giving a smooth finish. Core of mineral wool	wide range of colours	1 in.	6 ft. by 3 ft. 9 in.		0.25	no tests, probably 2 hrs.

The limitation of this subject to 'proprietary' panels which can be bought 'off the peg' is deliberate. For throughout our treatment of curtain walls we have been interested in the curtain wall as an *industrial* product and the characteristic production arrangement for industrial products is the turning out of standard lines, as distinct from 'specials.'

This treatment, however justified from the point of view with which we are concerned,

has disadvantages from the point of view of a logical presentation of panel infillings as such. Thus it excludes one very common type of panel infilling—that with a facing of natural timber—which is very suitable for factory production, simply because (to the best of our knowledge) no-one happens to manufacture a range of standard timber panel infillings.

Again, the 'panel infilling' as at present understood is not an easy concept to define. It may comprise the whole thickness of the

piece of wall it represents, from the external finish to the internal finish, or it may only comprise an external skin and may require a further panel on the inward side to make it a viable proposition. A common case of this is where fire regulations require that a combustible panel be provided with an incombustible back-up wall. The common practice in our present technological phase to provide different functional requirements with different physical entities (e.g. to provide an

[continued on page 220]

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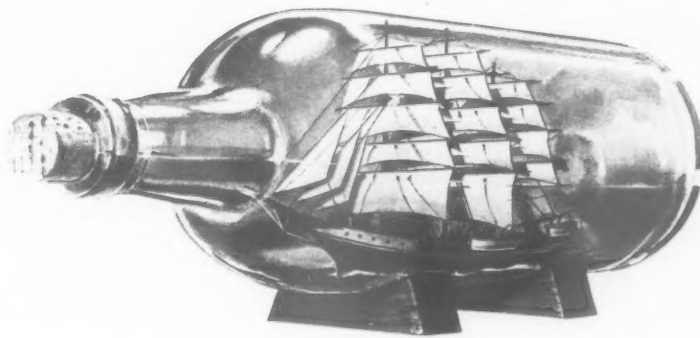
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continued from page 218]

external skin with one member, insulation with another, and an internal skin and vapour barrier with a third) has led to a kind of wholly legitimate commercial cannibalizing. Thus the Cape Asbestos Company have made trade agreements with a number of manufacturers of other products to manufacture a series of different 'off the peg' panels in which their product (Asbestolux) is incorporated with other proprietary materials. The practice is very common and in fact one of the most experienced panel makers, William Mallinsons, whose name is unfortunately excluded from this list, again because they do not manufacture a standard panel, undertake to fabricate panels from any reliable and suitable materials.

One point must be made concerning the table. The extreme right-hand column is headed 'fire resistance.' This is strictly a misnomer since 'fire resistance' is a property which attaches to a whole wall and the panel is, of course, only one element. When, therefore, the readings in this column are expressed as a time rating it must be assumed that the panels are capable of giving such a period of fire resistance provided the structure and the joints permit it. When, however, the reading is given with reference to flame spread or combustibility, it relates to the external finish of the panel itself. The most up-to-date reference in this country on the performance of materials used in infilling panels is contained in the two BRS Digests on *Light Cladding*, Nos. 98 and 99.

#### suppliers mentioned on preceding pages

Pilkington Bros. Ltd., St. Helens, Lancs.  
 Plyglass Ltd., Edinburgh Way, Harlow, Essex.  
 Hills (West Bromwich) Ltd., Albion Road,  
 West Bromwich, Staffs. Robertson Thain Ltd.,  
 Ellesmere Port, Wirral, Cheshire. Durasteel  
 Ltd., Oldfield Lane, Greenford, Middlesex.  
 Stewart & Gray Ltd., Swains Road, London,  
 S.W.17. Stramit Boards Ltd., Packet Boat  
 Dock, Cowley Peachey, Uxbridge, Middlesex.  
 Cape Building Products Ltd., Cowley Bridge  
 Works, Uxbridge, Middlesex. Mineralite Ltd.,  
 55 Dingwall Road, Croydon, Surrey. Joseph  
 Freeman Sons & Co. Ltd., Cementone Works,  
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 Street Place, London, E.C.4. Holoplast Ltd.,  
 New Hythe, near Maidstone, Kent. Laconite  
 Ltd., Halfway Green, Walton-on-Thames,  
 Surrey. Matthews Refractories Ltd., 21 Upper  
 Cheyne Row, London, S.W.3.

British Wood Preserving Association and the Timber Development Association entitled *Timber Preservation*,\* which sets down clearly the properties of the different types of preservative and of the different methods of application, and which states clearly to which class each available preservative belongs. A publication of this kind cannot go as far as the architect would wish: it cannot, for instance, say that Messrs. X's preservative is more expensive than Messrs. Y's and is not half as good, but it is of real value to know the class of each and what purposes that class can serve. An important point made by this booklet is that the method of application is at least as important as the material used. Painting and spraying is the least effective, next comes dipping, then steeping, then the 'hot and cold open tank treatment' and at the top of the scale come the various forms of pressure impregnation. Timber preservation, as the writers point out, is to be thought of as a form of insurance. The only pity is that there is no indication of the relative cost of the different treatments. It is good to know the kind of coverage you can expect from any insurance policy, but you also want to know the premiums. There are, of course, a thousand and one reasons why accurate price figures cannot be given, but it seems likely that a great many architects are discouraged from adopting a policy of systematic timber preservation simply because of uncertainty about the cost. Nevertheless, nearly all their other uncertainties are cleared up by this

\*obtained free from either organization.

[continued on page 222]

## THE INDUSTRY

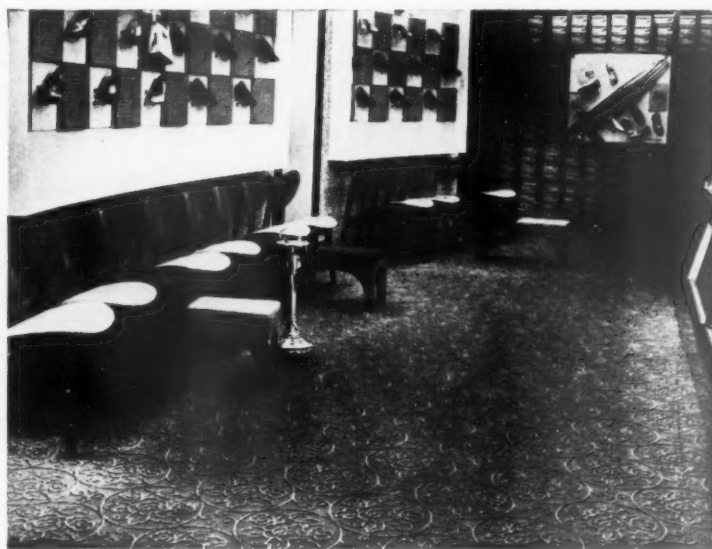
### A Book of Timber Preservatives

The makers of timber preservatives are traditionally immodest in their claims and are often inclined to be vague when pressed to explain to what class their products belong. For this reason we are glad to see a very useful book published jointly by the

### NEW BRISTOL STORE is carpeted throughout by CARPET TRADES LIMITED . . .

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A section of the Fashion Floor in Messrs. Jones of Bristol, showing 'DECORA' body, in Design No. 51003. Supplied in two different colour effects . . . a three-tone green and a three-tone mushroom. The raised 3-dimensional effect of the design is produced solely by the way in which the colours are used.

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\* Short for Leonard *thermostatic* valves which won't scan but nevertheless are used by discerning architects all over the world for showers and basins. More about them in pamphlet No. ZA 70

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continued from page 220]

booklet, and that is indeed something to be thankful for.

*British Wood Preserving Association*, 6 Southampton Place, London, W.C.1. *Timber Development Association Ltd.*, 21 College Hill, London, E.C.4.

## CONTRACTORS etc

**School at Sydenham.** *Architects:* Basil Spence & Partners. *General contractors:* Lavender McMillan (Contractors), Ltd. *Sub-contractors:* Structural steelwork: H. Young & Co. *Mechanical services and plumbing:* Z. D. Berry & Sons. *Electrical installation (school):* Duncan Watson, Ltd. *Metal windows and greenhouse:* Crittall Manufacturing Co. *Felt roofing:* Durable Asphalte Co. *Waterproofing:* Quickset Water Sealers, Ltd. *Wood flooring and cork tile flooring:* S. Bennett & Son (Wood Flooring). *Fibre board and suspended ceilings:* Walter Lilly & Co. *General ironfoundry:* H. & C. Davis & Co. *Hardwood handrails and joinery:* James Prepared Woodwork, Ltd. *Wood roller shutters:* Tidmarsh & Sons. *Terrazzo paving and finish to stairs:* Ventor Terrazzo & Mosaic Co. *Lightning conductors:* R. C. Cutting & Co. *Glaziers:* Faulkner Greene & Co. *Paint, painters and decorators:* Hadfields Ltd. *Gym equipment:* Olympic Gymnasium Co. *Horticultural work:* Wallace & Barr Ltd. *Tarmac and asphalt:* Durable Asphalte Co. *Derbydene walling and*

*paving and fire surround:* Nine Elms Stone Masonry Works, Ltd. *Concrete floors and framework:* Caxton Floors, Ltd. *Lifts:* Bennie Lifts, Ltd. *Television aerial:* T. A. Berry, Ltd. *Fume cupboards:* A. Gallenkamp & Co. *Chimney stack:* J. L. Kier & Co. *Felt roofing:* Permanite, Ltd. *Plastering and tiling:* Alan Milne. *Chain link fencing:* Skinner & Co. *Lino floors:* Pilkingtons Asphalte Co. *Facing bricks, blocks, partitions:* Broad & Co. *Common bricks:* London Brick Co. *Precast concrete:* Fabricrete Products, Ltd. *Sanitary fittings:* John Bolding & Sons. *Boilers, oil-fired:* Ideal Boilers and Radiators, Ltd. *Radiators:* Gulf Radiators, Ltd. *Heating units:* Flexaire, Ltd. *Electric light fittings:* Troughton & Young, Ltd. *Merchant Adventurers, Ltd.* *Holophone, Ltd.* *Falks Stadleman & Co.* *Stage lighting:* Strand Electric & Engineering Co. *Main switch gear:* Cantie Switches, Ltd. *Switch sockets and switches:* Wandsworth Electrical Co. *Radio and staff communicating system:* Clarke & Smith, Ltd. *Clocks:* Gent & Co. *Blinds:* S. C. Williams. *Fire fighting equipment:* Firesnow, Ltd. *Wallpapers:* Coles of Mortimer Street, John Line & Sons, Arthur Sanderson & Sons. *Fabrics:* Heals Contracts, Ltd. *Sliding door gear:* British Trolley Track Co. *Entrance gates:* Boulton & Paul, Ltd. *H. & C. Davis & Co.* *Cloakroom fittings:* Parker Winder & Achurch, Ltd. *Sliding partitions:* H. G. Puley (Romford), Ltd. *Light alloy doors:* Westland Engineers, Ltd. *Stage curtains:* Liberty & Co. *Chalkboards:* Wilson & Gardiner. *Aluminium channel (partitions):* Flexo Plywood Industries, Ltd. *Metal-faced plywood partitions:* Wm. Mallinson, Ltd. *Ironmongery:*

Fred Hodge, Ltd. *Kitchen fittings:* John Sadd & Son.

**House at Watford, Essex.** *Architects:* Alison and Peter Smithson. *Contractor:* Dickinson-Jones, Ltd. *Sub-contractors:* Heating: Benham & Sons. *Electrical:* F. J. Weight. *Roof:* Marley Tile Co. *Flooring:* Nairn's vinyl tiles: laid by 'Prodorite,' Ltd.; strip loloondo: Horsley Smith & Co. (Hayes).

**Hospital at Doha, Qatar.** *Architect:* John R. Harris. *General contractors:* Darwish Bros. *Services installation:* Matthew Hall & Co. *Reinforced concrete floors and roofs:* Costain Concrete Co. *Steelwork:* Dorman Long & Co.; T. W. Palmer & Co. *Synthaprupe:* National Coal Board. *Expansion joints:* Aluminium: Northern Aluminium Co.; Copper: Morfax, Ltd. *Jointing compound:* Expandite, Ltd. *Metal windows, flyscreens and sun-breakers:* Crittall Manufacturing Co. *Glass:* Pilkington Bros., Ltd. *Blinds:* J. Avery & Sons. *Joinery:* East & Sons. *Doors:* Jayanbee Joinery, Ltd. *Sanitary fittings:* Doulton Sanitary Potteries, Ltd. *Suspended ceilings:* Panels: Holoplast, Ltd. *Hardboard:* Bowaters Sales Co. W.C. and shower partitions: Holoplast, Ltd. *Door furniture:* James Gibbons & Co.; Comyn Ching & Co. *Aluminium glazed screens and loggia frames:* Fredk. Braby & Co. *Cooking equipment, sterilizers:* James Slater & Co. (Engineers), Ltd. *Extract hoods:* Wm. Kenyon & Sons. *Balustrades:* Wainwright & Waring, Ltd. *Air conditioning plant:* J. & E. Hall, Ltd. *Cooling units:* Matthew Hall & Co. *Cooling towers:* Film Cooling Towers, Ltd. *Housing of cooling units:* Tem-

perature, Ltd. *Protective joinery:* J. Wardley & Sons. *Protective barium aggregate:* Chance & Hunt. *Lifts:* Waygood-Otis, Ltd. *Laundry equipment:* Manlove, Elliott & Co.; L. G. Whitaker, Ltd. *Tiles:* Langley London, Ltd.; Richards Tiles, Ltd. *Steel tiles:* Prodorite, Ltd. *Teak block floors:* The Acme Flooring & Paving Co. (1904). *Decorative tiles and grilles:* Carter & Co. *Vent blocks:* The Leeds Fireclay Co. *Oil fired boilers:* John Thompson (Wolverhampton), Ltd. *Oil-fired incinerator:* The Incinerator Co. *Light fittings:* The General Electric Co. *Fire-fighting equipment:* Merryweather & Sons. *Paints:* Lewis Berger (Gt. Britain), Ltd.

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